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THE UNIVERSITY OF ALBERTA

INSERVICE EDUCATION FOR TEACHERS OF THE SEVERELY AND PROFOUNDLY HANDICAPPED

(C)

by

LAURIE A. MESTON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

AND RESEARCH IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF EDUCATION

SPECIAL EDUCATION - MULTIPLE DEPENDENT HANDICAPPED

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

SPRING, 1987

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled INSERVICE EDUCATION FOR TEACHERS OF THE SEVERELY AND PROFOUNDLY HANDICAPPED submitted by LAURIE ANNE MESTON in partial fulfillment of the requirements for the degree of Master of Education.

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DATED April 21st 1987

ABSTRACT

The purpose of the present study was to investigate the effects of an inservice training model presented to teachers who were teaching students with severe and profound handicapping conditions. Repeated observations of the students and staff in the classrooms were conducted in order to examine the effects of the inservice model. A multiple baseline design across subjects was used to evaluate the effects of the intervention. Box and whisker displays were used to assist with the visual analysis of the data.

The objectives of the inservice training model assessed in this study sought to provide teachers with the ability to practically apply teaching techniques in the areas of interaction between staff and students, functional instruction techniques, and organization of the classroom to maximize instructional time.

Although there was variability in the data across participants and settings, an analysis of the observational data over the thirty-one week period indicated that generally the teachers attendance at the inservice resulted in an increase in the percentage of time which staff spent in instruction, and increases in staff/student interaction and student/object interaction. Suggestions concerning possible relevent

variables and modifications to the Inservice are discussed.

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CHAPTER I

Introduction

The Problem

The educational needs of severely and profoundly handicapped children differ significantly from the needs commonly met by public educational programs (Dubose, 1978). Typical teacher training programs designed to educate teachers of the mildly and moderately handicapped focus on teaching pre-academic and academic skills, whereas, teachers of severely and profoundly handicapped students must be prepared to teach in the areas of self-care, sensory motor development, physical mobility and coordination, language, and social behavior (Smith & Smith, 1978).

One method of providing the knowledge which teachers require to work with this population is to use an in-service approach. In-service can provide an effective method of upgrading teachers skills (Gage, Fredericks, Johnson-Dorn, & Lindley-Southard, 1982), and keeping teachers abreast of new information in a rapidly changing field (Browder, 1983).

Statement of the Problem

This study was concerned with assessing the impact of a particular inservice training package (S.T.E.P.) delivered to teachers of the severely and profoundly handicapped in Edmonton, Alberta. The inservice included sections on assessment and curriculum, instructional design, 1:1 instruction, supervision of classroom staff, data analysis, group programming, working with parents and classroom staff, behavior management, total task instruction and classroom organization. Due to the comprehensiveness of the Inservice content it would have been difficult to assess all of the modules during the course of this study. Therefore, a review of the literature concerning instructional parameters for the severely and profoundly handicapped, and a thorough analysis of the Inservice training model were undertaken so that the most critical aspects of the training could be targetted.

The study was concerned with assessing whether the teachers' attendance at the Inservice resulted in significant increases in the percentage of time which classroom staff were engaged in instruction. In addition, changes in the quantity and type of

staff/student interaction, and student/object interaction were observed. Repeated observations of the staff and students in the classroom setting were carried out in order to assess the impact of the inservice training on the identified variables.

Scope and Limitations of the Study

Four classroom teachers of students classified as severely and profoundly handicapped agreed to participate in the study. Each classroom was staffed by one certified teacher and classroom assistants, with the ratios of staff to students ranging from 1:1.5 to 1:2.8. Two of the classrooms were sponsored by the Edmonton Public School Board and two by the Edmonton Separate School Board.

The study took place over a thirty-one week period with observers collecting data in the four classrooms. Data was collected using partial and momentary interval time sampling techniques. Observers recorded positive interaction, negative interaction, neutral interaction, appropriate object interaction, inappropriate object interaction, and no interaction between staff and students using partial interval recording of fifteen second intervals. Data on the amount of instruction which staff engaged in was recorded using momentary interval time sampling techniques. A multiple-baseline

across subjects design was used to assess the results of the treatment. Box and whisker displays were used to assist with the visual analysis of the data.

The characteristics of the research design preclude the possibility of making definitive statements concerning the relationship between participation in the S.T.E.P. Inservice and subsequent changes in the dependent variables. Given the heterogeneity of the participants and settings involved in the study the explanatory hypotheses can only be considered as tentative. Possible reasons for the results are discussed and potential modifications to the inservice to make it more effective for use with teachers of the severely and profoundly handicapped are presented.

CHAPTER II

Literature Review

Introduction

Students with severely and profoundly handicapping conditions are those students who because of the intensity of their physical, mental, or emotional problems or a combination of such problems, require educational, social, psychological, and medical services beyond those which have been offered by traditional, regular, and specialized educational programs (Thompson, 1974). These students require services which will maximize their full potential for useful and meaningful participation in society and for self-fulfillment (Thompson, 1974).

Baker (1979) reviewed the literature describing severely handicapped individuals and found that 80% of the articles included the following characteristics: 1. lack of self-care skills, 2. lack of communication skills, and 3. lack of mobility. Baker (1979) also indicated that severely handicapped individuals have limited ability to provide for their own basic life sustaining and safety needs.

In the province of Alberta, students with severely handicapping conditions are included under the category of dependent handicapped (Snart & Hillyard, 1985). The Alberta Education standards for inclusion in this category indicate that students must present at least one of the handicapping conditions listed below:

1. mental retardation at a severe/profound level (IQ approximately 30 or less);

2. extreme form of behavior disorder;

3. a sensory handicap along with another handicap

4. neurological impairment with critical loss of motor function such as speech, hand or eye movement, or paralysis;

5. a severe physical handicap, such that normally available educational assistance is inadequate (Snart & Hillyard, 1985).

Severely and profoundly handicapped individuals don't learn incidentally, automatically, rapidly, nor easily (Perske, & Smith, 1977), but require specific training in order to achieve their true potential. Therefore, they require teachers who have specialized training working with this population and have a strong conviction that these students can learn and that it is important to teach them (Perske, & Smith, 1977).

Staff Competencies

Since severely handicapped students have multiple problems, it is important that the teachers of these students have the skills, knowledge, and attitudes to encourage these students to develop to their full potential. Even the most seriously impaired of all disabled people have the potential for learning and growth (Haring & Smith, 1978).

Fredericks, Anderson and Baldwin (1979) define competencies as the knowledge, skills, and/or behaviors that teachers possess and are associated with appropriate pupil change. These competencies should be defined in terms of exemplary standards, not just average as this leads to mediocracy (Bernstein & Ziarnik, 1982).

Teacher competencies for teachers of the severely and profoundly handicapped have been discussed at length in the literature (Fredericks, Anderson, Baldwin, Grove, Moore, Moore, & Beaird, 1977). These competencies have been generated through survey forms (Milne, 1979), teacher input (Fredericks, et. al., 1979), classroom observation (Fredericks, et. al, 1979), and overview of teacher training courses (Paul, 1983).

Milne (1979) looked at competencies which teachers and administrators view as important when working with severely and profoundly handicapped students. The first five competencies suggested by teachers include: flexibility in management of learning activities, management of pupil self-concept, management of pupil self-discipline, communications development, and interaction with pupils during learning activities. Fredericks et al. (1979) developed a list of 86 competency indicators for teachers of the severely and profoundly handicapped. The authors' found that two indicators of competency (amount of instruction time and percentage of curriculum materials task analyzed) were the major contributors to the differences between teachers of students who made high gains, and teachers of students who made low gains. Another area of competency which was found to be significant in this study, focused on consequence delivery.

The more pronounced the level of the disability the more specific and precise are the competencies required of the teacher (Sontag, Burke, & York, 1973). Perske and Smith (1977) indicated that the education of these individuals requires training, talent, skill, and precision beyond that required in the preparation of professionals for other groups of exceptional children.

Bernstein and Ziarnik (1982) indicated that the ultimate test of staff competency is whether they produce changes to make clients more independent.

Non-handicapped students can acquire skills from a diverse number of sources including: parents, teachers, siblings, television, and toys. Severely handicapped students, however, require drastic environmental modifications to learn even basic skills and information (Sontag et al., 1973). Teachers of these students need to be able to sychronize curricula, management techniques, fun, play, and rest time into a smooth functioning and efficient schedule (Bates et al., 1981).

Therefore, teachers of this population require competencies beyond those which are expected of teachers of traditional or even exceptional populations (Perske & Smith, 1977). Wilcox (1977) suggests that:

> To hire teachers who lack these requisite competencies is to guarantee that schools will produce few significant changes in the life-style of the severely handicapped. (p. 418)

Horner (1977) further supports this viewpoint:

> Staffing a classroom for the severely and profoundly handicapped with a teacher who has no preparation in this area is somewhat akin to staffing a surgical unit with an intern. (p. 430)

The Need for Inservice Training

Few teachers who graduate from university with special education degrees are prepared to instruct students with severe and profound handicaps (Brooks, 1983). Paul (1983) states that graduates of special education programs and former teachers of the moderately mentally handicapped may have some basic competencies but lack the critical skills necessary. Even many professors of special education are not prepared to instruct teachers in educating students with severe and profound handicaps (Brooks, 1983).

Some skills which may not be addressed in traditional teacher training situations are: managing and training teaching assistants (Tucker & Horner, 1983), working with a multi-disciplinary team, including physiotherapists and speech therapists (Levine, Elzey, & Fiske-Rollin, 1979), specific curriculum content such as toilet training, consequating appropriately, task analysis (Fredericks et al., 1979), and teaching functional skills in functional context. Even if teachers do learn skills appropriate for teaching this population, often this knowledge is gradually abandoned once teachers face real life situations (Liberty & Wilcox, 1982). One reason for this may be that university training

programs do not teach teachers to work in the real world (Paul, 1983). Teachers of the severely and profoundly handicapped must be able to incorporate theoretical/conceptual ideas into practical programming experiences, for students who require extensive practice to learn simple skills.

Since the role of the teachers of the severely and profoundly handicapped is so complex, extending beyond the traditional teacher role, inservice is of particular importance (Wilcox, 1977). Inservice training can be an effective method of distributing new information (Browder, 1983), upgrading teacher skills (Gage, Fredericks, Johnson-Dorn, & Lindley-Southard, 1982), changing attitudes, and teaching alternate strategies (Tucker & Horner, 1977). It can also have a significant positive impact on the quality of current programming (Ryor, Shankar, & Sandefur, 1979).

It is not reasonable to assume that a given training period can prepare a person for a lifetime in any complex profession (Egbert & Kluender, 1979). In order to maintain professional status some sort of upgrading or ongoing input must occur (Mercer, Forgnone, & Beattie, 1978). Thomas (1980) suggested that teachers should be required to engage in continuing/ongoing learning opportunities through

inservice training in order to stay abreast of new ideas, research, and information in the field.

Due to economic need, availability of maternity leaves, improvement of salaries and benefits, and the difficulty in relocating two career families, teachers are staying longer in job situations, therefore decreasing the amount of teacher attrition (Carpenter, 1979). Because of lower teacher attrition the number of new teachers is small. As a result, the influx of new ideas and attitudes into the system is not occurring through pre-service training (Carpenter, 1979). Therefore, the need for inservice training is on the rise (Browder, 1983).

Gardner and Giampa (1971) found that in-service education produced institutional attendants who were more efficient and effective. Staff who had taken the inservice training spent more time in teaching and training with students than in custodial duties. Gage, et al. (1982) reported the results of an inservice training program provided to managers and direct care personnel employed in community, residential, and vocational programs for developmentally disabled adults. They found that 97% of the training objectives were completed by the trainees at established criterion levels and that a high percentage of the trainees maintained these skills at criterion levels.

Kelly and Vanvactor (1983) describe the relative cost effectiveness of inservice approaches in remote, sparsely populated schools. They found that inservice approaches which occurred close to the teacher's classroom and included a practicum component were most effective.

Although much of the literature encourages increased attention to staff development on an ongoing basis (Bernstein, & Ziarnik, 1982, Browder, 1983, Carpenter, 1979), some teachers are not supportive of inservice activities (Martocci & Nickles, 1978). Dillon (1979) described teachers' perception of inservice as only slightly more palatable (and necessary) than death and taxes.

Quilitch (1975) found that employees in an institution for the mentally handicapped were very positive towards an in-service workshop approach but put nothing into practice afterwards. Even if teachers agree with what they hear it may not change what they actually do (Hentschel, 1977). It is therefore important to examine the components and presentation methods of effective inservice approaches.

Effective Inservice Programs

In order for an inservice training program to be effective the following points should be included and planned prior to the inservice: identification of objectives, decision regarding the appropriate level of intensity, determination of effective content delivery, selection of qualified staff, selection of appropriate incentives, and evaluation of inservice effectiveness (Browder, 1983).

Objectives

Templeman, Fredericks, Bunse, and Moses (1983) indicate that one of the five critical items which should be considered in the development of a training model is that there are specified instructional objectives with stated criterion levels of acceptable performance. These specified objectives assist in relating the objectives of the inservice to effective teacher activities. The objectives should be clear and in the most specific format possible (Korinek, Schmid, & McAdams, 1985). Mann (1976) found that the least successful inservice training programs included no specific goals. Once the objectives are stated a variety of highly structured activities should then be

designed to develop the skills necessary to complete the objectives.

In order for training packages to be effective the trainee should: know what specific change is desired, recognize the discrepancy between his/her own behavior and the behavior which is desired, and be willing to modify his/her own behavior (Hentschel, 1977).

Level of Intensity.

Inservice can incorporate a wide range of formats including campus courses, on site courses, workshops, conferences, retreats, consultations, projects, modules, laboratory experiences, literature reviews, and materials development (Drummond, 1979). Using a variety of activities within inservice training is probably more effective than the use of a single activity for all participants (Jensen, Betz, & Zigarmi, 1978).

Planning a variety of activities helps to maintain approriate pacing. A balance should be encouraged between listening and participating, individual and group work, and theory and practice (Healy, 1983).

Formats which appear to be most popular with teachers include demonstrations of materials and techniques, directed small group discussions, work

groups resulting in production, lectures followed by group discussion, and brain storming (Jensen, et al., 1978). Demonstrations and the use of media (videotapes) to show application of concepts and procedures are preferable to lecture alone (Mann, 1976). These practical approaches encourage teachers to become actively involved with the techniques, provide role-models, and allow teachers to practice the various concepts before trying them in their classrooms.

Independent study was found to be a less effective instructional method than approaches which used direct instruction (Kelly & Vanvactor, 1983). Mann (1976) urges planners of inservice packages to keep in mind that many teachers don't like to read.

Live demonstrations of techniques, materials, or strategies contribute to learner comprehension (Rutherford & Weaver, 1974) and are viewed by teachers as being extremely valuable (Zinkel & Albert, 1979). Mann (1976) found that the most successful inservice packages included demonstrative lessons done by the trainer with no participation or responsibility required on the part of the trainee. This procedure also helped to establish the trainer's credibility (Mann, 1976).

Korinek, et al (1985) found that demonstrations, supervised practice, and specified feedback were more effective than having teachers store ideas for future use. These activities which include direct participant involvement enable teachers to practice ideas and concepts and receive constructive feedback rather than trying to remember ideas which were presented without visual demonstration or practical application. Materials which were pre-packaged, self-paced, multi-media, multi-topic, and designed to maximize active participation and early success were found to be most effective (Mann, 1976).

Activity-based experiences, those which engage the learner in direct participation, appear particularly useful (Houston & Freiberg, 1979). Active participation can take place in both 1:1 and group activities (Healy, 1983). Rude (1978) agrees that practical applications should assume priority over discussions of theory. Kelly and Vanvactor (1983) found that practica maintained the benefits of inservice.

Content.

When designing inservice content, attention should be devoted to translating contemporary research into classroom practice (Mercer et al., 1978). It is important that content is planned in response to assessed needs so that the participant can relate the content to his or her classroom situation (Korinek et al., 1985). Content that is practical and directly applicable is perceived by teachers as most valuable (Dillon, 1979).

One method of increasing the practicality of inservice content is to encourage client input into the goals (Healy, 1983). This can be done through a needs assessment to determine what teachers want to learn. This proactive approach to the identification of staff development needs is supported by Bernstein and Ziarnik (1982). They contend that the content of a staff training program should be determined by what staff should be able to do at the end of the program.

Staff development should emphasize design of systems which will insure on-going use of staff skills (Bernstein & Ziarnik, 1982). Rude (1978) found instructional procedures to be the first choice of teachers for inservice content.

It is preferred that the same conditions teachers can expect to encounter in public school classrooms are duplicated as nearly as possible (Wilcox, 1977). Dillon (1979) states that inservice which is delivered close to the classroom appears to be the most helpful and teachers appear to accept more readily the content associated with such an approach. School based training rather than college based training was found to be more effective (Korinek et al., 1985).

Templeman, et al. (1983) indicated that initial training should take place at a demonstration site. The trainee is removed from his or her work environment and brought to a demonstration site where the model is seen funtioning in it entirety. By removing trainees from their own work site a large number of potential distractors are eliminated and the trainee has the opportunity to see the entire model in operation.

Selection of Staff.

Korinek, et al (1985) indicated that inservice should be voluntary rather than mandatory. Voluntary attendance encourages teachers to participate more enthusistically in the inservice. This support of the inservice by the participants can also be enhanced if the inservice is in support of the general effort of

the school and not a "single shot" presentation (Korinek et al., 1985). Ongoing use of techniques will be more likely if the entire school staff is familiar with and supportive of the concepts presented during the inservice.

Administrator support and involvement in the inservice also encourages more staff participation and implementation of the ideas presented (Korinek et al., 1985). Another method of encouraging active staff participation is to use members of the school staff as presenters and group leaders during the inservice (Healy, 1983).

Training programs should target all personnel not just teachers (Paul, 1983). All individuals working in the classroom and school need to be aware of techniques which have been suggested during the inservice.

Consultants who will be providing follow-up and support to teachers should be determined prior to the inservice (Healy, 1983). This follow-up assistance in the trainee's classroom should be timed to occur at the beginning of the implementation efforts by the teacher. Technical assistance, further training, and reinforcement of current efforts get the teacher over the "hump" traditionally encountered when implementing new procedures (Templeman et al., 1983). The most effective inservice programs had the availability over

time of training staff as a source of help (Mann, 1976).

Incentives.

Rewards and reinforcers should be an integral part of an inservice program (Korinek et al., 1985). These incentives can take the form of release time, payment for participation, academic credit, salary step credit, certification renewal and/or personal recognition (Browder, 1983). Incentives, such as those listed above, motivate the participants to attend more enthusiastically to the inservice and continue the strategies once they are back in their classrooms.

Inservices should be scheduled within the school day whenever possible (Jensen et al., 1978). Korinek, et al (1985) found that inservices which were offered at convenient times were more effective. Breaks should be scheduled throughout the day (Healy, 1983).

Evaluation.

All inservice programs should have preplanned evaluation and followup (Jensen et al., 1978). Without an evaluation component the benefits of the inservice to the teacher are difficult to identify (Browder, 1983). Jensen, et al (1978) found that teachers were

critical of inservice programs which did not have built-in evaluation.

While current inservice literature emphasises the need for design, surprisingly little emphasis is given to the necessity for evaluation, not only of the teacher, but of the resultant impact on students (Gold, 1972).

Adams (1977) analyzed 135 inservice models to determine the presence of best practice design and evaluation measures. Fifty-one percent of the models surveyed used pre and post measures of trainee knowledge acquisition, only 39% used direct observation of trainees during training. Even fewer models employed posttraining evaluation. Seven percent of the models issued posttraining questionnaires to trainees, three percent conducted in-field follow-up, one percent had in-field pre and posttest data, and one percent used a competency checklist at the time of the infield follow-up.

Traditional approaches to the evaluation of inservice have measured change in terms of knowledge, skills, or attitudes required at the close of inservice (Mercer et al., 1978). This evaluation method, however, is limited since the goal of inservice is for the teacher to incorporate the knowledge gained into classroom activities (Smith & Siantz, 1978).

Bernstein and Ziarnik (1982) suggested that evaluation should occur through direct classroom observation of staff. Follow up visits assure maintenance and generalization of the skills learned. Hall and Loucks (1978) indicated that change is a process not an event. Therefore, the effects of inservice should be viewed across time and in an incremental manner (Powers, 1983). Observations at frequent intervals after training are one approach to achieving this goal (Mann, 1976).

The impact of the training beyond the initial individual trained is another facet of evaluation which needs to be considered (Powers, 1983). Since most classrooms for the severely handicapped are staffed by paraprofessionals as well as the teacher it is important to note if there is any spread of effect to the other staff in the classroom (Paul, 1983).

Clark and Macrae (1976) found that packages where trainees received modeling, verbal feedback, graphic feedback, and quiz contingencies on their use of a particular teaching skill reliably increased their knowledge of that particular skill. When inservice goals were associated with the acquisition of new skills and behavior, supervised trials with feedback provided an effective strategy (Smith & Siantz, 1978).

Who should evaluate teachers is another aspect of evaluation which needs to be considered. Although teachers should be aware of their own growth (Dillon, 1979), self-ratings alone are not always an accurate measurement of progress (Hentschel, 1977). Mann (1976) suggested that evaluation be completed by an individual outside the teachers school-based chain of command. Through the use of an external evalutor the fear that the evaluation data can be used to the teachers professional detriment, can at least be partially alleviated (Powers, 1983).

Summary.

Students with severely and profoundly handicapping conditions have complex needs, which require teachers to have specialized training in order that these students develop to their maximum potential. Teacher training institutions do not always provide teachers with the necessary skills to teach this population. Also, the technology is constantly changing and therefore even teachers who were initially trained during pre-service training to work with these students require updating. One method of imparting the necessary knowledge to teachers is through an inservice training model.

In order for an inservice model to be effective, consideration must be given to developing specific inservice objectives, presenting a variety of activities to maintain effective pacing, and inclusion of practical content which is directly applicable and developed through teacher input. In addition, teachers should voluntarily attend the inservice, be provided with administrative support, and classroom follow-up should be provided by trained consultants. Evaluation needs to be pre-planned and built into the inservice on an on-going basis.

Instruction and Learning

Once the outline of the inservice is in place, the content to be taught must be addressed. Fredericks et al. (1979) maintain that content for inservice packages for teachers of the severely handicapped should include instruction focused on maximizing instructional time, task analyzing curricula, and appropriate delivery of consequences.

Rosenshine (1977) found that instructional time was one of six factors that correlated positively with achievement. The concept that more instruction results in more learning has been established with both higher

functioning populations (David, 1974) and lower functioning populations (Fredericks et al., 1979).

The teacher skill affecting achievement is the maintenance of a high level of pupil task involvement (Rosenshine, 1980). Task involvement is defined as the percentage of time students are actively engaged in the curriculum to be learned (Rosenshine, 1980). Attention to or interaction with materials is generally considered to lead to knowledge and skill. A measure of the amount of attention to or engagement with activities should provide a highly functional, evaluative device (LeLaurin & Risley, 1972).

Wiley and Harnischfeger (1974) indicated that the time needed for learning and the time actually spent in learning are the two major determinants of achievement. Achievement is directly determined by only 2 variables: total time needed by a pupil to learn a task and the total time a pupil actively spends on a given learning task.

> The time an individual needs to learn a specific task or reach a particular goal is influenced by his aptitude, his ability to understand instruction (which is itself influenced by "general intelligence" and "verbal ability") and the quality of instruction to which he is exposed" (Wiley & Harnischfeger, 1974). (p. 8)

Fredericks et al. (1979) indicate that instructional time is the most critical variable

affecting the performance gains of severely and profoundly handicapped children. They found that the "number of instructional minutes per day" accounted for 65% of the variance between teachers whose students made high gains and teachers whose students made low gains. Teachers whose students made higher gains provided a mean of approximately 40 minutes more instruction each day (3 1/4 hours more per week) than low gain teachers.

Englert (1984) contends that low achieving children may require more practice opportunities in order to master concepts. Milne (1979) surveyed 23 administrators and 88 teachers to find which competencies were most important for individuals working with the severely and profoundly handicapped. The teachers included interaction with pupils during learning activities as one of the first five competency indicators. Warren and Mondy (1971) studied the interactions between fifteen ward staff and forty-nine institutionalized, mentally handicapped children. They found that staff usually failed to respond to either the children's appropriate or inappropriate behavior.

Spangler and Marshall (1983) indicated that institutionalized severely and profoundly handicapped children have low activity levels with little or no involvement in purposeful or appropriate tasks. This

opinion is supported by Katz and Yekutiel (1974) as they contend that severely and profoundly handicapped individuals have minimal interactions with peers or adults and prefer sedentary activities such as watching television. Observational studies of ward staff's behavior have indicated that they spend relatively little of their total work time interacting with residents in training (Harmatz, 1973).

Therefore, programs specifically designed to increase activity level should be an important consideration in providing services for severely and profoundly handicapped individuals (Spangler & Marshall, 1983). Although it has been documented in the literature that more impaired students require more time in instruction many severely and profoundly handicapped students receive substantially less instructional time than children in higher functioning disability areas. They have a higher proportion of absences due to illness and take more time in physical care (McCormick, Cooper & Goldman, 1979).

Staff/Student Ratio

An instructional factor found to increase instructional time for students with severely and profoundly handicapping conditions is to increase the

student/staff ratio. Snart and Hillyard (1985) found that instructional time in classrooms for dependent handicapped students increased greatly with decreases in student/staff ratio. Wrestling, Ferrell and Swenson (1982) found that 1:1 instruction was superior in terms of the number of instructional minutes per child. They found that more minutes were spent teaching the IEP objectives and that students' spent less time doing nothing. Due to the physical and instructional problems of severely and profoundly handicapped individuals an approach including highly individualized instruction and low learner to staff ratios is needed (Knapczyk & Dever, 1979).

The wide range of individual differences in the severely handicapped population and oftentimes their unmanageability, often means that effective instruction can only be achieved in a 1:1 relationship. Therefore, the utilization of paraprofessionals to provide individualized instruction in the classroom is considered manadatory (Fredericks, Baldwin, Grove, Riggs, Furey, Moore, Jordan, Gage, Levak, Alrick, & Wadlow, 1979).

Although instructional time appears to increase greatly in classrooms where there are decreases in student/staff ratio, it must be implemented within the economic limits of the particular school board (Snart &

Hillyard, 1985). This decrease in the student/staff ratio is not always possible due to economic restraints.

Organization of the School Day

Another method for increasing instructional time in classsrooms, and thereby affecting student progress, is to modify the organization and content of the school day. Fredericks et al. (1977) maintain that the orchestration of the environment in order to maximize instructional time is the overriding consideration in classrooms for the severely and profoundly handicapped.

McCormick and Goldman (1979) contend that caretaking consumes a significant amount of time in classes for the severely and profoundly handicapped. In a self contained public school unit, 65% of teacher and aide time was devoted to tasks including diapering, toiletting, feeding, dressing, transporting, positioning, administering medication, and postural drainage. Severely impaired classroom proportions were 62% and 78%, while the higher functioning classroom averaged 50% (McCormick & Goldman, 1979).

McCormick, Cooper, and Goldlman (1979) report the results of a study which indicated that instructional time can be increased by teaching teachers to integrate

instruction into caretaking routines. For Teacher A, the mean percentage of time given to instruction alone rose from 43% to 59%, Teacher B 46% to 48%, and Teacher C 52% to 58%. When instruction alone and instruction provided in conjunction with caretaking are examined they give an index of the total amount of instruction provided each day. The mean percentage for Teacher A rose from 46% (baseline) to 71% posttraining, Teacher B, from 51% to 63%, Teacher C from 56% to 76% and Teacher D from 44% to 52%. This rise is a mean daily gain for the four teachers of 16.25% or 29 minutes if 3 hours of instruction is used as the criterion.

McCormick and Goldman (1979) contend that caretaking is an ideal time for instructional interactions and that all professionals being prepared to work with severely and profoundly handicapped persons should be taught to use caretaking as a vehicle for instruction whenever possible. Mothers are able to combine instructional content with routine activities in order to teach their youngsters to perform necessary daily routines. The use of instruction during caretaking activities helps to make caretaking more human and personal (Ainsworth, 1962).

Increasing Instructional Time.

Direct teaching of methods which teachers can use to increase instructional time can also improve learning. Spangler and Marshall (1983) trained child care workers in an institution for the mentally handicapped to use specified techniques (play manager routines) in order to increase purposeful activity among a group of institutionalized boys. A system of prompts, increasing the availability of toys, and regular staff monitoring was used. On the average activity level increased from ten percent to a mean of seventy percent during treatment. Inappropriate behavior dropped from ten percent to seven percent. Gardner and Giampa (1971) found that in-service education produced a more efficient and effective institutional attendant who spent more time in teaching and training and less time in custodial duties.

Spreat, Piper, Deaton, Savoy-Paaff, Brantner, Lipinski, Dorsey, and Baker-Potts (1985) studied the effect of supervisory feedback on staff and client behavior in an institution. They found that during the study staff were observed to devote greater portions of time to interaction with clients, this resulted in a reduction in inappropriate client behavior. Burg, Reid and Lattimore (1979) looked at a self-recording procedure to increase staff interaction with

institutionalized people. During baseline, interaction occurred on an average of one every fourteen observations. After treatment interaction occurred one out of every two observations. They found no detrimental change in other areas of staff responsibilities, e.g. area and resident cleanliness. An increased number of interactions between staff and residents may have served to heighten staff's awareness of resident's being soiled or wet. Positive interactions between staff and institutionalized mentally handicapped individuals can promote development, eliminate inappropriate behavior and realize life with dignity (Spreat et al., 1985).

Staff/Student Interaction

Rosenshine (1976) found that the type of teacher questions, type and number of student responses, and adult feedback also correlated postitively with achievement. Gable, Hendrickson and Young (1984) found that the systematic delivery of instruction, i.e. introducing an antecedent model and differentially consequating pupil's correct responses corollated with higher rates of appropriate responses than any less rigorous teaching strategies. Teachers with skill in providing immediate teacher feedback (e.g.

reinforcement, prompts, or hints) following correct responses and errors produced greater learning than teachers who did not provide immediate feedback (Englert, 1984).

More effective special education teachers differed significantly from less effective teachers with regard to 1) number of trials presented per minute, 2) number of correct responses obtained per minute and c) the percent of incorrect pupil answers followed by prompts rather than telling responses. Effective teachers used a brisker pace and elicited more correct responses per minute. More effective teachers in the study were moderately differentiated by their acknowledgement of correct responses through praise and reinforcing comments (Englert, 1984).

Summary

Time spent in instruction is a critical variable affecting the performance gains of severely and profoundly handicapped students. Since these students have significant delays it is important that as much time as possible is spent in instruction.

This increase in instructional time can be achieved by increasing the staff/student ratio, modifying the organization of the school day,

integrating instruction into caretaking activities, and/or teaching specified interaction techniques. A combination of the previously listed techniques can also be used.

Another important aspect of instruction to consider when programming for students with severe and profound handicapping conditions is the quality of the staff/student interaction. The consistent delivery of cues and consequences and positive interactions between staff and students appear to correlate with achievement.

CHAPTER III

Independent Variable

Description of the Inservice Model

The Systematic Training for Educational Programming (S.T.E.P) Inservice Training Model was developed to train teachers working with severely and profoundly handicapped students in classrooms in Northern Alberta. This training package was based on the Teaching Research Inservice Model developed by the staff of the Special Education Department of the Division of the Oregon State System of higher education (Federicks, Baldwin, Grove, Riggs, Furey, Moore, Jordan, Gage, Levek, Alrick & Wadlow, 1979).

Modifications were made for use by the Edmonton Public School District. These modifications included, the addition of sections focusing on functional assessment, functional curriculum, behavior management - the communicative function of behavior, total task teaching and working with classroom staff. The instructional design module was changed to stress the use of functional cues and consequences rather than strictly verbal cues and consequences. The group programming module was modified to focus on teaching activities in groups rather than the use of stimulation

activities, and the data analysis module was changed to emphasize the updating of total task sequences.

Objectives of the S.T.E.P. Inservice Training Package

The major objectives of this inservice model were to develop teacher competency in the areas of assessment/curriculum, instructional design, 1:1 instruction, supervision of classroom staff, data analysis, group programming, working with parents and classroom staff, behavior management, and total task instruction. For a more detailed description of the inservice objectives see Appendix A.

Organization of the Inservice

Content.

Day one of the training week was devoted to orientation and observation of a demonstration classroom operated by a trained teacher. This experience provided the inservice participant with an opportunity to see the model operating in its' entirety and provided a reference point during the following four days of training. During days two to five, participants were presented with various activities and lectures which lead towards the completion of the inservice objectives.

Direct practicum experience was an integral part of the training. These practicum experiences were highly structured and followed a format of:

1. Demonstration of the task or role by a staff - trainer.
2. Preparation for the task or role under the guidance of a staff trainer.
3. Performance of the task or role by the trainee.
4. Formal observation and feedback to the trainee on a frequent basis.

The content for the inservice model was continually modified through teacher, classroom aide, principal and consultant input. At the close of each training week the participants were asked to give feedback on the parts of the training which were beneficial and those areas which were not considered to be appropriate. Suggestions for change were encouraged. Updating of the content occurred regularly in response to expressed need. It was believed that content that is directly applicable to teachers will be more valuable and have a more lasting effect (Dillon, 1979).

The inservice model consisted of the following components:

1. Assessment/Curriculum: This module consisted of the presentation of various ecological assessment strategies. The use of ecological inventories, observational assessments, and parent interview strategies were presented. The importance of integrating instruction into caretaking activities and functional activities was emphasized. Advantages and limitations of standardized assessment and curriculum packages were also examined.

The module was presented through lecture format with video tape and overhead support. The trainees participated in practice sessions designing functional teaching sequences and administering standardized assessments. The homework assignment consisted of the trainee designing a functional teaching sequence based on three IEP goals for a student.

2. Instructional Design: This module consisted of a discussion on the appropriate method of delivering cues and consequences to students. The section on cues included a description of rules governing the administration of cues, types of cues, suggestions for enhancing cue delivery, and generalization of cues. The section on consequences addressed the different types of consequences - reinforcement and correction procedures, types of reinforcement, the use of

reinforcer checklists, the use of primary reinforcement, natural reinforcement, and the use of natural correction procedures.

Directed practice of the techniques learned during the instructional design lecture occurred during the practicum experiences. The homework assignment consisted of answering study questions related to the lecture and readings information.

3. 1:1 Instruction: Teachers were taught the roles and responsibilities of staff when they were involved in individual instruction. This information was provided through lectures and prescribed readings from "A Data Based Classroom" (Fredericks et al., 1982). Teachers practiced the 1:1 role in the training classroom. During these sessions the teacher's performance was monitored by training staff, who determined baseline performance scores and provided corrective feedback directly related to the performance objectives. Skill mastery was determined when the teacher reached or surpassed the criterion designated in the performance objectives.

Instruction was also provided to prepare teachers to write individual instruction programs according to the guidelines contained in Fredericks et al. (1982). The essential components of a program page, general

information page, program cover page, task analysis, and various data formats were discussed. A training manual, containing recommended readings, provided teachers with additional information to explain how to create a package of written programs for an individual student. Evaluation of mastery of this component was measured by the teacher's performance in a written exercise, which required the development of written programs for a student in any two instructional domains.

4. Supervision of Staff: Teachers were trained to utilize Individual and Group Observation Forms (Fredericks et al., 1982), to supervise and evaluate performance of classroom staff in terms of their ability to appropriately deliver cues and consequences and record data. In addition, the staff member's ability to involve all students in group activities and to provide a positive learning environment were measured.

An explanation of the components of each form was provided through a lecture and assigned readings. Teachers practised using the Individual Observation Form by watching staff role-play. They completed the Group Form while viewing a videotape of a small group instructional session. Demonstrations of reliability

between the participants and training staff occurred in the demonstration classroom.

Teachers were also taught guidelines for delivering feedback to classroom staff on their performance during group and individual instruction. This was accomplished through lectures, readings and observation of trainers. In the training classroom, teachers provided feedback to classroom staff whom they had observed under the supervision of the training staff.

5. Data Analysis: Teachers were presented with a set of rules for analysing program data for both individual and group programs. These rules were used as a basis for making modifications to instruction based on student performance. The guidelines were based on (Fredericks et al., 1982). Instruction was provided through lecture, role-play, and a practice session in which teachers updated actual programs of students in the training classroom under the supervision of the training staff.

Teachers were provided with supportive resources in the form of a self-instruction package and recommended readings from Fredericks et al. (1982). Mastery of the instructional content was based on the participant's performance on a written exercise. This

exercise involved updating a sample of the written programs for one student.

6. Group Instruction: This module consisted of the presentation of guidelines and strategies which could be used when working with groups of students. The importance of group instruction as a method of encouraging interaction with peers and appropriate language skills in context was emphasized. Suggestions for functional activities which were appropriate for group instruction were presented, as well as a strategy for developing activities. Various methods of data collection were also examined. The homework assignment consisted of the teacher generating a list of appropriate activities around a functional theme.

7. Working with parents and teacher aides: This module presented strategies for working effectively with parents and teacher aides. Topics included the importance of encouraging parent/teacher communication, methods for promoting communication, improving communication with teacher aides, defining classroom responsibilities, and resolving conflicts. Teachers were encouraged to present strategies which had worked in their classrooms to enhance their relationship with both parents and classroom assistants.

8. Behavior Management: This module focused on the communicative aspects of behavior. The steps in completing a functional analysis of behavior, how to measure a behavior, reinforcement strategies, and a description of various intervention techniques were included. A taxonomy for classifying behavior adopted from Donnellan, Mirenda, Mesaros, and Fassberder (1984), was also presented.

9. Total Task: This module focused on the importance of total task instruction and steps involved in developing total task instruction. It included: writing the program, cues, consequences, setting the criterion for advancement, data collection, updating, and deciding what skills were appropriate for total task instruction.

The inservice package included both training at a supervised demonstration center and follow-up at the teacher's own classroom (Templeman et al., 1983). The initial training involved a one week training session at a designated training site in an Edmonton Public School District classroom for Dependent Handicapped Students. The staff at the demonstration site had been trained in the model components and the standards in the classroom met or exceeded the implementation criteria.

The demonstration site used was chosen to be as close to the teacher's own classroom as possible in terms of student population, materials and staff ratio. This supported Wilcox's (1977) premise that conditions which teachers can expect to encounter in their classroom should be duplicated as closely as possible during training, in order to facilitate generalization of content.

Follow-up training and evaluation were provided at the teacher's own classroom. This provided on-site feedback for the teacher and enabled the trainer to give practical suggestions.

Level of Intensity

The inservice package combined a variety of different activities in order to maintain appropriate pacing (Healy, 1983) and provide a balance of activities (Jensen et al., 1978). Live demonstration of strategies and active participation by the teachers were incorporated into each of the modules. This procedure supported Mann's (1976) premise that those activities designed to maximize active participation were the most beneficial. Supervised practice paired with specified feedback was used in most of the modules (Korinek et al., 1985).

See Table 1 for instructional methods used in the presentation of inservice content.

Selection of Staff

Staff participation in the training package was voluntary (Korinek et al., 1985). Administrator support of the teacher's attendance at the inservicee was encouraged (Korinek et al., 1985). The consultant support which was provided during the follow-up was determined prior to the teacher's attendance at the inservice (Healy, 1983). This assistance supported the teacher in implementing the strategies presented (Templeman et al., 1983) and was implemented over time to provide ongoing assistance (Mann, 1976).

Incentives

The inservice was scheduled during the school day so that teachers did not have to use their own time to attend (Jensen et al., 1978). A substitute teacher was hired to cover the teacher's class during her week attendance at the inservice so that the distractions during the training week were minimal.

Table 1

Inservice Training Package
Presentation of Content

CONTENT	METHOD OF PRESENTATION
1) Assessment/Curriculum	Lecture/Visual Aids Role Play/Corrective Feedback Homework Assignment
2) Instructional Design -classroom roles	Lecture/Visual Aids Demonstration Role Play/Corrective Feedback Study Questions
3) 1:1 Instruction (Written Program - clipboard)	Lecture/Visual Aids Role Play/Corrective Feedback Homework Assignment
4) Supervising Classroom Staff	Lecture/Visual Aids Demonstration Role Play/Corrective Feedback
5) Data Analysis	Lecture/Visual Aids Demonstration Role Play/ Corrective feedback Homework Assignment
6) Group Programming	Lecture/Visual Aids Demonstration Role Play/ Corrective feedback Homework Assignment
7) Working with Parents and classroom staff	Lecture/Visual Aids Small group discussion
8) Behavior Management	Lecture/Visual Aids Small group discussion Study question
9) Functional Programming	Lecture/Visual Aids Small group discussion

Evaluation

The effects of the inservice training were evaluated through direct observation of the objectives listed previously. This evaluation occurred both during the training week and during the follow-up visits.

During practicum experiences, each participant was formally observed in his/her interactions with students. The trainee's performance was recorded on an observation form and at the conclusion of the observation period the teaching performance was reviewed with him/her. Trainees were observed working with students in 1:1 and group teaching situations. In addition, each trainee observed the demonstration staff in each of the roles and completed the form. They were then observed giving feedback to the staff both in the 1:1 and group situations. Feedback was then given to the teachers on their performance.

Homework assignments were completed each evening during the training week and marked the following morning. Feedback was given to each trainee on his or her performance and revisions were encouraged if the trainee had difficulty with the assignment.

Follow-up visits to the trainee's classroom were designed to measure maintenance of specific teaching skills acquired during the training session, and

provided further training to remediate any difficulties the trainee may have encountered in the application of methods learned during the training session. For the purposes of measuring the degree of implementation, separate components were defined. These components were described on a rating sheet which included how the observations were to be made, how the data was to be recorded and the criterion levels necessary for completion.

After each follow-up visit the teacher was provided with a letter, outlining the teacher's progress in each area and listing suggestions for improvement. This letter was not sent to administrators unless requested by the teacher.

Templeman et al. (1983) reported the results of their study evaluating the effectiveness of the Teaching Research Inservice Training Model with 99 trainees. They found that 98% of the objectives targetted during the training session were completed at specified criterion levels by each trainee. When observed in their own teaching sites, trainees demonstrated the implementation of 99% of the components at criteria. Also, gain scores achieved by students in classrooms where the teacher was trained in the Teaching Research Inservice Model indicated

significantly greater skill gains than did a similar sample of children where the model was not utilized.

The preceding discussion has described the S.T.E.P. Inservice Training Model which was developed to upgrade teacher's competencies in educating students with severely and profoundly handicapping conditions. This type of inservice model was necessary due to the complexity of needs of this population (Wilcox, 1977) and the lack of pre-service training focused on the teaching techniques appropriate for these students (Brooks, 1983).

The techniques described in the literature which facilitate an effective inservice training approach have been incorporated into the S.T.E.P. training in order to maximize the probability that this training would have an impact on the staff's behavior in the classroom. However, it was important that actual staff performance in their respective classrooms was measured directly so that the efficacy of the training is evaluated. Therefore, specific variables to be measured have been selected and will be discussed in more detail in Chapter Four.

CHAPTER IV

Rationale

As highlighted in the literature review and description of training, the skills and competencies of the instructional staff are crucial ingredients to a successful program for students with severely and profoundly handicapping conditions. The research literature on staff training previously discussed outlines the important components of a successful inservice program for teachers which can increase the probability that the newly acquired skills will generalize to the classroom.

It is important to realize however, that the only means of effectively evaluating the impact of the inservice on the teacher's and classroom assistant's behavior, was to systematically observe this behavior in the classroom. Therefore, in the present study, repeated observations of the behaviors of the classroom staff and the students were conducted within the classroom setting to evaluate the impact of the inservice training on the staff-child, child-child, and child-object interaction patterns. The discussion of the rationale and specific research questions as they relate to the inservice training program follows.

As discussed during the description of the STEP inservice training package one of the overall objectives of the training was to increase the teacher's ability to organize the classroom, including supervising staff and organizing student's programs. During the instructional design module the teacher was instructed in various techniques which would assist the classroom staff to increase positive interaction with students, increase the amount of instruction in the classroom, decrease negative interaction with students, and increase the student's interaction with objects and activities. In addition, the importance of integrating instruction into daily caretaking activities was emphasized.

It was predicted that through the use of these techniques by the teacher and classroom staff, the amount of ('down time') which students experienced in the classroom would be reduced and be replaced with more task involvement and instructional time. An increase in instructional time and pupil task involvement had been shown to correlate with higher levels of achievement (Rosenshine, 1980). Fredericks et al. (1979) found that students who received more minutes of instruction per day made greater gains than

students who received a lower number of instructional minutes per day. It was therefore considered important to examine strategies to increase student's rate of learning and assess the amount of instruction and interaction which students were experiencing in classrooms.

Since this area appeared to be an important consideration for students with severe and profound handicaps, and the number of objectives included in the total STEP inservice training program were extensive, only those objectives related to the student's interaction with people and objects in the environment, and the amount of instruction in which classroom staff engage in the classroom were chosen for study. The specific research questions which this study sought to answer were therefore related to the establishment of the degree to which the objectives related to this portion of the inservice training had been realized. The first research question focussed on observation of the classroom staff, whereas research questions two through eight focussed on observation of the students in the classroom.

Research Questions

1. As a result of training, was there a significant increase in the percentage of time which the classroom staff spent in instruction?

2. As a result of training, was there a significant increase in the percentage of positive interactions which students received from classroom staff?

3. As a result of training, was there a significant decrease in the percentage of negative interactions which students received from classroom staff?

4. As a result of training, was there a significant change in the percentage of neutral interactions which students received from classroom staff?

5. As a result of training, was there a significant decrease in the percentage of time which students were not receiving interaction from the classroom staff?

6. As a result of training, was there a significant increase in the percentage of the students interaction with objects and activities?

7. As a result of training, was there a significant decrease in the percentage of the students inappropriate interaction with objects and activities?

8. As a result of training, was there a significant decrease in the percentage of time which students were not interacting with the teaching staff, other students, objects, or activities (down time)?

Operational Definitions

The following instructional variables involve observation of classroom staff, rather than students and have been modified from those described in a study by Snart and Hillyard (1985).

1. Instructional Programming: Any activity of the teacher/assistant which involved interaction directly, related to, and part of, a program to increase the student's ability to perform the activity. This could take place during a caretaking activity such as dressing or in an isolated program such as teaching colours.

Non-Instructional Time:

a) Lunch: Teacher/Assistant was involved in activities related to the student's lunch eating. If the teacher/assistant was instructing the student then both instructional programming and lunch is recorded.

b) Preparation: When activity of the Teacher/Assistant involved the procurement of materials and/or equipment for use in programming (including, for example, walking toward the selected materials), and setting up the materials and equipment (example, lunch dishes). Preparation may have involved activity both within, and outside of, the classroom.

c) Changing position: Teacher/Assistant was either carrying the student, moving the student in a wheelchair, physically assisting the student to change positions between different activities or supervising physical movement between activities.

d) Toileting: Teacher/Assistant was involved in activities (including physical movement to the bathroom area) related to toileting and clean-up.

e) Clean-up: Teacher/Assistant was involved in the clean-up of materials or students, such as gathering up materials, or washing faces after lunch.

f) Dressing-Undressing: Teacher/Assistant was involved in dressing or undressing a student; obtaining or hanging up clothing such as boots and scarves.

g) Transportation: Teacher/Assistant was involved in taking students to and assisting students onto handibus.

h) Medication/First Aid: Teacher/Assistant was involved in obtaining and/or administering regular medication or emergency first aid to a student.

i) Data: Teacher/Assistant was involved in recording or data collection.

j) Conversation: Teacher/Assistant was involved in conversation with other staff, parents, or visitors.

k) Administration/Scheduling: Teacher/Assistant was engaged in work pertaining to classroom organization, for example, scheduling.

l) Supervision: Teacher/Assistant was observing an activity or supervising an activity but was not directly involved with a student or students.

m) No Activity: Teacher/Assistant was not involved in any activity.

For the purposes of the study, the dependent variables involving observation of students were defined as follows:

2. Positive interaction: was defined as any contact, verbal or physical, delivered by staff, which was intended to encourage the student to repeat a behavior. For example, "good work", a pat on the back.

3. Negative interaction: was defined as any contact, verbal or physical, delivered by staff, which was intended to discourage the student from repeating a behavior. For example, "no", "wrong".

4. Neutral interaction: was defined as any contact, verbal, physical or gestural, delivered by staff, which was intended to neither discourage or encourage the student to repeat the behavior, for example, conversation. This category also included assisting students through activities e.g. putting on the student's coat.

5. No staff interaction: This category was used if the student received no positive, negative, or neutral interaction during the interval. It indicated that the student received no adult interaction.

6. Object/activity interaction: The student was interacting with an object or activity in the manner in which it was designed to be manipulated or interacted with.

7. Inappropriate object/activity interaction: The student was interacting with an object or activity in a manner in which it was not intended to be used.

8. No interaction: There was no contact between the student and staff, students, objects or activities. The student was either doing nothing or engaging in self-stimulatory behavior.

Chapter five presents the methodology used in this study. In addition, the observational system used in the collection of the data is discussed. The results of the data collection process are presented and described in chapter six.

CHAPTER V

Methodology

Subjects

The teachers in the four classrooms who participated in the inservice were the primary participants in the study. The goal was to see if the teacher's attendance at the inservice and subsequenct implementation of the strategies taught, resulted in changes in the staff-student interaction and amount of instruction in the classroom.

In order to measure the resulting change, the students and classroom staff in each of the four classrooms were observed. Data were aggragated across all participants in each of the classrooms. Therefore, each classroom was treated as a subject in the study. Subsequent analysis of the data concentrated on the average percentage of interactions and instruction for all of the staff and students in the classroom, not individual students or staff.

The students in classrooms A, B, and D, were all designated as fitting the criteria for inclusion in programs for the dependent handicapped (Snart & Hillyard, 1985). The students in classroom C all had severe disabilities but had not yet been diagnosed as

Dependent Handicapped due to the age of the students. Teachers of the classrooms chosen had volunteered to be trained using the STEP inservice training model. Two of the classrooms were under the auspices of the Edmonton Public School Board and two were under the Edmonton Separate School Board. One of the Edmonton Public school classrooms was an early childhood pre-school classroom.

For research question one, the researcher was interested in the percent of instruction which classroom staff engaged in during the day. Therefore the classroom teachers and support staff employed in each of the four classroom were observed. The teachers and support staff involved in these classrooms varied in their previous training and experience working with this population. Classroom staff information is summarized in Appendix B.

For research questions two to eight, the researcher was interested in the interactions between staff and students, and students and objects. Therefore, the students enrolled in each of the four classrooms were observed. The students ranged from 4 years to 18 years. In addition to severe developmental delay, some of the participants also had diagnoses of cerebral palsy, motoric disabilities, behavioral disorders, visual impairments, hearing impairments,

convulsive disorders, and/or autism. Appendix C lists the specific characteristics of the students.

Settings

The two Edmonton Public School classrooms were both located in different elementary schools in Edmonton, Alberta. Classroom A served eleven students between the ages of 6 and 17 years. The students arrived at the school at 9:30 AM and departed at 2:30 PM, Monday to Friday. Students were all transported to the school by a private bus company. There was one teacher and three aides in the classroom. Only nine of the ~~eleven~~ students in the classroom were observed during the study as one of the students was on extended medical leave and one arrived in the fifth month of the study.

Classroom C served five students between the ages of 3 and 5 1/2 years. This was an early education program located in an Edmonton Public elementary school but funded by the Early Childhood Services branch of Alberta Education, Province of Alberta. The students in this program all had developmental delays and other associated handicapping conditions, but were not all diagnosed as fitting the criteria for dependent handicapped. This program ran from Monday to Thursday,

from 1:00 P.M. to 3:45 P.M. Students were transported to and from the program by taxi. There were one teacher and two aides in the program.

Classrooms B and D were both Edmonton Separate School classrooms and were located in the same elementary/junior high school in Edmonton, Alberta. They were both housed in the same wing of the school with one other classroom for younger students who fit the criteria for inclusion in a program for dependent handicapped students. The students in these classrooms attended school from 9:00 A.M. until 3:00 P.M., Monday to Friday. The students were transported to and from school by a private bus company. Table 2 contains specific information concerning the characteristics of each program.

Independent Variable

The independent variable was the classroom teacher's participation in the STEP training program described in Chapter 2. Teachers volunteered to participate in the inservice training program. Subsequent to their volunteering they were asked to participate in this study. The teachers were told that we were evaluating the effects of the training program in the teacher's classroom. Specific details

TABLE 2

Program Characteristics

Program No.	Number Teachers	Number Aides	Number Students	Ratio
A	1	3	11	1/2.8
B	1	3	9	1/2.2
C	1	2	5	1/1.7
D	1	3	9	1/2.2

of the content of the study were not given. If teachers did not want to participate in this study they were not denied access to the inservice program.

Dependent Variables

The dependent variables in this study were defined as follows:

1. Instructional Programming: Any activity of the teacher/assistant which involved interaction directly, related to, and part of, a program to increase the student's ability to perform the activity. This could take place during a caretaking activity such as dressing or in an isolated program such as teaching colours.

2. Positive interaction: This was defined as any contact, verbal or physical, delivered by staff, which was intended to encourage the student to repeat a behavior. For example, "good work", a pat on the back.

3. Negative interaction: This was defined as any contact, verbal or physical, delivered by staff, which was intended to discourage the student from repeating a behavior. For example, "no", "wrong".

4. Neutral interactions: This was defined as any contact, verbal, physical or gestural, delivered by staff, which was intended to neither discourage or encourage the student to repeat the behavior. For example, conversation. This category also included assisting students through activities e.g. putting on the students coat.

5. No interaction: This category was used if the student received no positive, negative, or neutral interaction during the interval. It indicated that the student received no adult interaction.

6. Object/Activity interaction: The student was interacting with an object or activity in the manner in which it was designed to be manipulated or interacted with.

7. Inappropriate Object/Activity interaction: The student was interacting with an object or activity in a manner in which it was not intended to be used.

8. No Interaction: There was no contact between the student and staff, students, objects or activities. The student was either doing nothing or engaging in self-stimulatory behavior.

For a more detailed description of the Dependent Variables see Chapter 3.

Research Design

Single Subject Design.

Single-subject research provides the experimenter with a method of rigorously evaluating the effects of interventions with individuals (Kazdin, 1982). It allows comparison between an individual's behavior under one condition and under other conditions (Sulzer-Azaroff & Mayer, 1977). This design differs from group research techniques where the averages of the group are collected, thereby obscuring individual changes (Hersen & Barlow, 1976).

Another difficulty encountered in group research designs is the collection of large numbers of homogeneous clients who can be matched on various attributes (Hersen & Barlow, 1976). If the subjects used in group research are animals (or college sophomores), the matching of relevent personality characteristics is more feasible. When dealing with severely handicapped students, however, the possibility of obtaining sufficient clients suitably matched to constitute the required groups in the study is almost impossible. Individuals classified as being

severely/profoundly handicapped are widely divergent, not only in their impairments (severe mental retardation, serious emotional disturbance, blindness, deafness, and/or immobilizing orthopedic conditions), but also in their functional retardation, their special service needs, and their ultimate potential (Dubose, 1978).

Another difficulty when using group research techniques is that progress is assessed usually only once or twice using pre-test, post-test measures. The small number of data points and the averaging of the results is often responsible for the "weak" effect obtained in these studies where some clients show considerable improvement, other deteriorate, and the average improvement is statistically significant but clinically weak (Hersen & Barlow, 1976).

Single subject designs, with their emphasis on replication and graphic analysis of data, increase the capacity for independent evaluation of research (Parsonson & Baer, 1978). Intervention effects are replicated within the same subjects. Subjects serve as their own controls, and comparisons of the subjects' performances are made as different conditions are implemented over time (Kazdin, 1982).

Research designs, such as single subject design that can be modified to produce, intensify, or moderate

changes in the ongoing behavior of subjects or be altered in response to unplanned events, such as the loss of some subjects or changes in staffing or procedures, and still give rise to valid data and meet the realities of research in applied settings (Parsonson & Baer, 1978)

Multiple Baseline Design.

A multiple baseline across settings design was employed in this study. With a multiple baseline design the intervention effects are demonstrated by introducing the intervention to different baselines (e.g. persons) at different points in time (Sulzer-Azaroff & Mayer, 1977). If each baseline changes when the intervention is introduced, the effects can be attributed to the intervention, rather than to extraneous events (Kazdin, 1982). If changes between baseline and treatment occur in only one out of four cases then it is not possible to attribute the changes to the independent variable. Changes in three out of four or all of the settings gives more credibility to the hypothesis that the independent variable was responsible for the changes observed.

In this study, baseline data were collected on the dependent variables for each subject over a period of

two to three weeks prior to the classroom teacher's participation in the STEP inservice training program. After the training, the teacher was instructed to implement the techniques learned during the training in his or her classroom. Data were then collected to observe the effect of the training on the dependent variables. This process was repeated subsequently with three other teachers (see Table 3).

Due to the collection of data in natural environments, some modifications to the multiple baseline design were made. Since the scheduling of the training sessions for each of the teachers was determined prior to their decision to be involved in this study, the overlap between the baseline phases for classrooms A and B was shorter than desired. Also, the baseline data for classrooms C and D did not overlap with the baseline data for classroom B. The teachers of classrooms C and D both attended the same training session, but treatment data for classroom D was collected slightly later than that for classroom C. On some occasions, data could not be collected every week due to events beyond the control of the researcher. These included: staff illness, class outings, observer illness, and teacher conferences. Even though the multiple baseline design was altered slightly, the intervention was still introduced to

Table 3

Multiple Baseline Across Subjects

Subjects	Week of Observation																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Class A	B	B	B	B	B	+	-	T	T	*	*	T	-	T	-	-	-	T	T	-	T	T	-	//	-	-	T	-	-	T	-
Class B	B	B	B	-	B	B	B	B	+	*	*	-	T	T	T	T	-	T	T	T	-	T	-	//	-	-	T	-	T	-	-
Class C	-	-	-	-	-	-	-	-	-	*	*	-	-	B	B	B	B	+	-	T	T	T	T	//	-	T	-	T	T	-	T
Class D	-	-	-	-	-	-	-	-	-	*	*	-	-	B	B	B	B	+	-	-	-	T	T	//	-	-	T	T	T	T	T

B = Baseline

+ = Teachers at inservice

T = Treatment observations after inservice

* = Christmas Holidays

// = Spring Break

- = Missing Observations

different baselines at three different points in time, thus providing the ability to attribute the effects to the intervention.

The multiple baseline design used in this study was essentially an across settings design since different classrooms were used in the study. Although the students in each of the classrooms were different, they were essentially all considered to fit the dependent handicapped criteria (see subject section).

Data Display

To assist with the visual comparison of the data a box and whisker display was used. In the box and whisker display the two end circles represent the highest and lowest scores, the box indicates the 25th and 75th percentiles, and the line drawn across the box shows the median. Whiskers join the highest and lowest scores to the box (Maguire, 1986).

Measurement Procedures

The participants were observed using interval time-sampling recording techniques. A momentary time sampling technique was used to collect the data for research question one. The classroom staff served as subjects. During momentary time sampling the subjects

were observed at the end of the interval (Sulzer-Azaroff & Mayer, 1977). Whatever was occurring at that moment was recorded.

At the end of the interval the staff were observed and the appropriate designation of their behavior was made. The data sheet included the following categories which correspond with the descriptions of the dependent variable found in Chapter Four.

1. instruction
2. lunch
3. preparation
4. positioning
5. toiletting
6. cleaning
7. dressing
8. transportation
9. medication
10. data
11. discussion
12. administration
13. supervision

In instances where the staff were instructing in one of the areas listed, i.e. dressing, the response was recorded under instruction and dressing.

For research questions two to eight a partial-interval time-sampling system was used to record the behavior of the students in the classroom. During partial-interval recording a specific block of time is selected (such as a thirty minute observation period). The time is then divided into equal intervals of relatively short durations (i.e. 15 seconds). A specified behavior is then recorded a maximum of once

per interval throughout the observation period, regardless of the duration of the behavior or how many times it occurs during the interval.

For questions two to eight the students in the classroom served as the subjects. Each student was observed for fifteen seconds and the observer recorded their behavior under the following categories (these correspond to the dependent variables listed in Chapter Four).

1. positive interaction
2. negative interaction
3. neutral interaction
4. appropriate object interaction
5. inappropriate object interaction
6. no interaction

In addition, the recorded behavior was subsequently analyzed and the intervals in which the student received positive, negative, or neutral interaction from staff were recorded as having staff interaction. Those intervals where these behaviors were not recorded were marked as no staff interaction.

In this study two minute observation periods were used to collect data for questions two to eight with data collection for research question one occurring at the end of these two minute observation periods. At the end of a ten minute period the observer would record data on different research questions for

approximately ten minutes and then return to research questions one to eight.

In order to facilitate data collection the observers listened to a pre-recorded tape which marked the fifteen second intervals. Earphones were used so that the sound did not disrupt the staff and students in the classroom.

To enhance the standardization of measurement conditions, the environmental conditions and the time of day during which the measurements were taken were held constant across the length of the study. In addition, any changes in the classroom or with the subjects were noted by the observers. These notations assisted with the interpretation of the data.

Interobserver Agreement

During the study reliability measures were collected at least once during baseline and twice during treatment phases for each of the classrooms in the study. Two observers would simultaneously collect data on each of the students in the classroom and would then collect data simultaneously on the classroom staff. Reliability was calculated by the following formula:

$$\text{Point-by-Point Agreement} = \frac{A}{A + D} \times 100$$

Where A = agreements for the trial or interval

D = disagreements for the trial or interval

The point-by-point agreement ratio is one of the more commonly used methods in applied research (Kelly, 1977). This method provides the opportunity to evaluate observer agreement for each observation interval therefore providing a more precise outcome than the frequency ratio which evaluates agreements on totals (Kazdin, 1982).

Interobserver agreement was calculated individually for each of the variables. This was done to insure that the target behavior was well defined. If the agreement was calculated over all of the variables confusions on a specific variable may have been missed.

Two different observers were used during the course of the study. In addition, two graduate students participated in the reliability measures with each of the two observers. For specific results see Tables 4 and 5. Reliability ranged from 70% to 100% and was

Table 4

Interobserver Agreement

Subject	Week	Condition	Positive Interact.	Negative Interact.	Neutral Interact.	No Adult Interact.	Approp. Object	Inapprop Object	No Interact.
Classroom A	2	Baseline	92%	89%	82%	86%	89%	88%	92%
Classroom A	14	Treatment	90%	93%	80%	84%	88%	89%	90%
Classroom A	21	Treatment	87%	90%	80%	83%	82%	80%	88%
Classroom B	5	Baseline	81%	88%	72%	85%	83%	92%	82%
Classroom B	22	Treatment	85%	87%	84%	84%	83%	88%	88%
Classroom B	29	Treatment	80%	89%	70%	72%	75%	87%	76%
Classroom C	15	Baseline	95%	100%	82%	89%	88%	94%	88%
Classroom C	26	Treatment	92%	100%	88%	92%	90%	94%	90%
Classroom C	28	Treatment	100%	100%	88%	94%	86%	100%	94%
Classroom D	17	Baseline	98%	100%	82%	84%	88%	100%	90%
Classroom D	23	Treatment	98%	100%	84%	87%	90%	97%	95%

Table 5

Interobserver Agreement

Subject	Week	Condition	Instruction	Supervision	Lunch	Preparation	Position	Toilet	Clean	Dress	Transportation	Medication	Data
Class A	2	Baseline	82%	95%	95%	90%	87%	96%	100%	100%	92%	100%	88%
Class A	14	Treatment	80%	98%	92%	88%	90%	94%	96%	100%	90%	100%	96%
Class A	21	Treatment	86%	100%	90%	90%	92%	94%	92%	100%	94%	100%	100%
Class B	5	Baseline	80%	100%	84%	88%	82%	90%	90%	100%	92%	100%	90%
Class B	22	Treatment	84%	98%	88%	86%	80%	92%	90%	100%	96%	100%	100%
Class B	29	Treatment	84%	100%	90%	88%	88%	96%	88%	100%	94%	100%	100%
Class C	15	Baseline	82%	80%	98%	82%	100%	92%	86%	100%	98%	100%	92%
Class C	26	Treatment	88%	82%	100%	86%	98%	90%	86%	100%	98%	100%	86%
Class C	28	Treatment	82%	78%	96%	80%	100%	94%	84%	100%	96%	100%	92%
Class D	17	Baseline	88%	96%	100%	92%	96%	96%	100%	100%	96%	100%	100%
Class D	23	Treatment	84%	98%	96%	88%	92%	90%	100%	100%	98%	100%	100%

maintained at a mean of 87% throughout the study. Reliability was calculated on approximately 140 intervals per observation time.

It should be noted that since the study was conducted in naturalistic settings it was difficult to complete reliability checks of which the observer was unaware. These covert reliability checks enhance the reliability of the data, since it has been found that observers show higher interobserver agreement when they are aware that reliability is being checked than when they are unaware (Kazdin, 1982). On two occasions this was done for a portion of the observation period. The percentage of agreement during these two partial sessions was slightly higher than some of the sessions, but was not significantly higher than the overall average.

It has been found that observer expectancies can influence the observational data when combined with experimenter feedback as to positive or negative trends in the data (Kazdin, 1982). For this reason, feedback provided to the observers was primarily restricted to comments about the accuracy of the observations. Observers were not shown graphs of the data until the end of the study.

Teacher Training and Follow-up Visits

After five weeks of baseline, the classroom A teacher attended the S.T.E.P. inservice training. The content of the training was discussed in chapter three. After seven weeks of baseline, the classroom B teacher attended the inservice. Thirteen weeks after the teachers in classrooms A and B were trained, four weeks of baseline was begun in classrooms C and D. Then both teachers of classrooms C and D attended the inservice.

At the close of the inservice the teachers were requested to begin implementing the techniques presented during the week in their respective classrooms. A follow-up visit by one of the inservice presenters was scheduled to occur approximately three weeks after training to answer any staff questions or concerns and to monitor the implementation of the strategies presented during the inservice. Positive feedback was given to the staff on their effective use of the techniques presented during the inservice. Modelling of the correct method of implementing the strategies was used if the staff were having difficulty.

After the first visit, at least two further visits were scheduled to provide intermittent feedback to the classroom staff on their proficiency in using the

various strategies. Classroom teachers were also encouraged to contact the inservice personnel if they had any questions or concerns.

Internal and External Validity

Internal Validity.

"Internal Validity refers to the degree of certainty that manipulation of the independent variable is responsible for observed changes in the dependent variable" (Kratochwill, 1978, pg. 11). A discussion of the possible threats to internal validity and the steps taken to control these influences follows.

1. History: Historical confounding can be a major difficulty in experiments where data collection occurs over a long period of time. This increases the possibility that extraneous event may cause changes in the data which is collected, confounding the true intervention effects (Kratochwill, 1978). The use of a multiple baseline design lessens the possibility of historical confounding since experimental control is repeatedly demonstrated with the introduction of the intervention across subjects (Kratochwill, 1978).

2. Maturation: It is possible that changes over time result from special events in the subject's life or

from physical, emotional, and/or maturational changes within the subject (Kazdin, 1982). These changes can be minimized by careful analysis of trends in the baseline data (Parsonson & Baer, 1978) and by use of a multiple baseline design which allows for an extended baseline period for some subjects (Grigg, 1983)

3. Testing: Testing refers to any change in the dependent variable which may be attributed to the effect of repeated assessment (Kazdin, 1982), or to the measurement process itself (Kratochwill, 1978). In some cases, observers entering a classroom to observe subjects' behavior may cause the subjects to act differently (Kratochwill, 1978). The multiple baseline design lessens the chance of this since repeated measures are taken over time and the subjects become familiar with the observers in the classroom. In addition, steps were taken to control for the reactive effects on the part of the observers.

4. Instrumentation: It is possible that changes in the data over time can occur from gradual changes in the criteria which the observers use to score the subject's performance rather than from progress in the subject's behavior (Kazdin, 1982). This is of particular concern when the data are collected by human observers (Kelly, 1977).

In order to control for observer bias or drift, repeated reliability checks were taken and the cautions explained in the interobserver agreement section were exercized.

5. Instability: When repeated measurement of a subject over time occurs it is possible that the natural variation in the data collected can be incorrectly attributed to the intervention (Kratochwill, 1978). The greater the variability in the data, the more difficult it is to demonstrate that changes in the data series are a result of the intervention (Kratochwill, 1978). Variability in the data can be caused by environmental events, observer drift, problems with observational methodology, and/or changes within subjects (Kazdin, 1982). Attempts were made to control for these variables through observers noting any changes in the environment or subjects, conscientious monitoring of the observational methodology, and consistent checks on interobserver agreement. Further discussion concerning the instability of the data will be covered in chapter five.

6. Reactive Interventions: Another threat to the internal validity of the study can occur if the experimenter introduces the intervention as a reaction to a previous or impending change in the data series.

This could confound the intervention effects with extraneous factors which shift the data series in the expected direction of change (Kratochwill, 1978). Since the dates for each training session were pre-determined the baseline and intervention periods were decided accordingly. Therefore the timing of the intervention was not dependent on the level of the baseline data.

External Validity.

External validity refers to the extent to which the results of the study can be generalized beyond the conditions of the study (Kazdin, 1982). External validity can involve population-sample considerations as well as environmental influences (Kratochwill, 1978). The following discussion involves those factors which could effect the external validity of this study.

1. Generalization across subjects: Even though the findings of a study may be internally valid, they may not be generalizable to subjects whose characteristics may differ from those included in the study (Kazdin, 1982). Although the majority of students' in the study were classified as dependent handicapped, the heterogeneity of this population precludes the possibility of matching subject variables. However,

since the dependent handicapped population is typically heterogeneous, the evaluation of the data across four classrooms of students, increases the generalizability of the data to the population of interest (Grigg, 1983). Hersen and Barlow (1976) concur that an appropriate method of increasing the base for generalization is to repeat the study several times across different subjects.

2. Generalization across settings: In order to encourage the generalization of the results to more than one setting the study was systematically repeated in four different classrooms (Kazdin, 1982). Each of these classrooms differed in the number of students, number of staff, hours of operation, and age of students. Although the settings did vary, the inservice personnel who delivered the S.T.E.P. inservice and participated in the follow-up consultation were held constant across all subjects. Therefore, it would be difficult to generalize these findings across other inservice personnel or inservice packages.

3. Explicit Description of the Independent Variable: A comprehensive description of the independent variable and the method of the presentation was included in Chapter Three. A review of this description of the

S.T.E.P. training can provide the necessary information to estimate the degree with which the findings can be generalized to other settings (Kratochwill, 1978).

4. Hawthorne Effect: It is possible that a subject's knowledge that they are participating in an investigation can alter their responses to the interventions (Kratochwill, 1978). If their responses are significantly altered, the generalization of the effects of the intervention to subjects who do not have this knowledge will be questionable (Bracht & Glass, 1968). Although it is unlikely that the behavior of the students' in the study would be affected by this knowledge, it is possible that the behavior of the classroom staff could be influenced. Therefore, the observers were instructed to be as unobstrusive as possible. In addition, the considerable length of time which the observers were in the classrooms increased the comfort level of the staff and encouraged more natural behavior from the staff.

5. Novelty and Disruption Effects: Kratochwill (1978) suggests that the introduction of an unusual or novel intervention can cause an effect which occurs as a function of novelty phenomena which can become absent as the intervention progresses. In addition, the intervention can cause disruption in the normal

classroom routine rendering the intervention less effective during the initial phase of the study (Kratochwill, 1978). The multiple baseline design used in the study should reduce the impact of this effect, since the treatment effects are measured over time.

6. Experimenter Effects: It has been suggested that the experimenter and/or observers can intentionally or unintentionally affect the subject's behavior so that the intervention does not generalize to other experimenters and/or observers (Kratochwill, 1978). Precautions were taken to reduce observer bias by not discussing the trends in the data or giving specific feedback to the classroom staff on their improvement. The use of the same personnel during the inservice training and follow-up however, could limit the ability to generalize the results across different training staff.

7. Interaction of History and Intervention Effects: The use of a multiple baseline design across subjects assists in controlling the confounding influence of historical variables. It is highly unlikely that when the treatment effects are replicated across subjects over time that in each case a particular historic event could be responsible for the occurring change (Grigg, 1983).

8. Measurement of the Dependent Variable: In order to ensure that the operational definitions of the dependent variables remained intact, frequent inter-observer reliability checks were made.

9. Interaction of Time of Measurement and Intervention Effects: The use of a multiple baseline across subjects design minimizes increases the ecological validity of an investigation since the results of the treatment effect are demonstrated over time (Kratochwill, 1978).

Presentation of the results of the present study will occur in Chapter Six, with the discussion of these results following in Chapter Seven.

CHAPTER VI

Results

The purpose of this study was to evaluate the effects of the STEP inservice training program on the dependent variables described in Chapter Four. In order to facilitate the analysis of the treatment effects, the data were graphed across each of the four classrooms involved in the study. The mean percentage of the occurrence of the behavior, as well as the median, 25th and 75th percentiles and the range of the scores are included in the "box and whiskers" displays.

Research Question # 1

> As a result of training, was there a significant increase in the percentage of time which the classroom staff spent in instruction?

This question was evaluated through a visual analysis of the graphic data collected on the percentage of time which classroom staff spent in instruction. Instruction was defined as any activity of the teacher/assistant which involved interaction directly related to, and part of, a program to increase the student's ability to perform the activity. This could take place during a caretaking activity such as

dressing, or in an isolated program such as teaching colours. (See Chapter Four).

The data on the dependent variable of instruction was collected over a period of 31 weeks using a momentary time sampling procedure. Each staff member was observed on a ten second rotating time sample schedule. If the staff member engaged in behavior which corresponded to the previously described definition, at least once during the interval, the behavior was recorded as occurring.

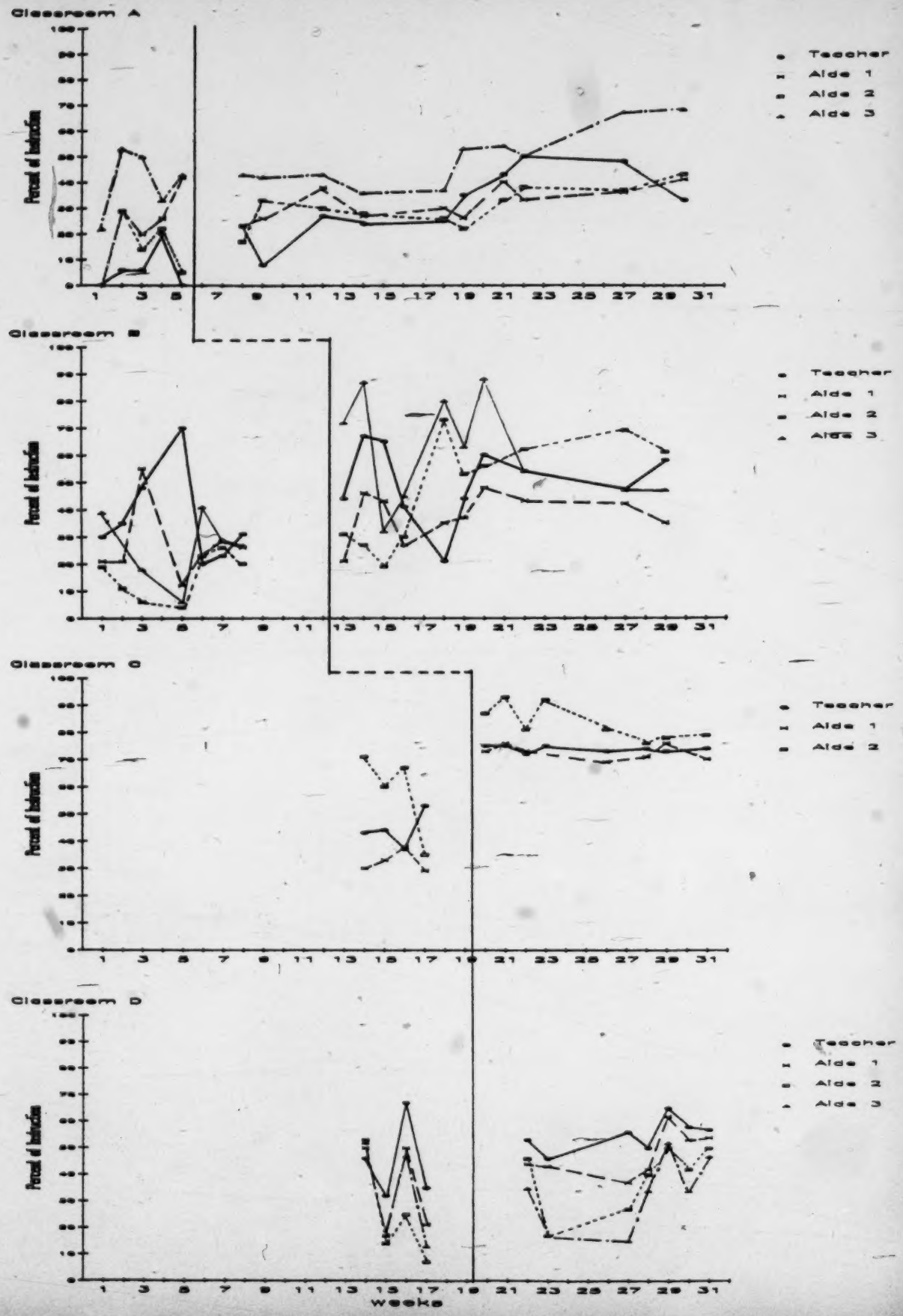
Figure 1 shows the percentage of time which staff were engaging in instructional activities. The mean percentage of instruction for each of the classroom staff is indicated by the different symbols.

Classroom A

Teacher: A steady increase in the level and trend of the data path was seen over the course of treatment. This finding indicates that the teacher increased the percentage of time which she spent in instruction after the independent variable was introduced.

Aide 1: An increase in the trend of the data was seen during baseline. The treatment data showed a drop in the level of the data and little change in the level or trend of the data during the treatment phase.

Figure 1
Mean Percent of Instruction per Staff Member



Aide 2: A variable baseline phase was followed by an increase in the level of the data and a slight continuous increase in the trend during the treatment phase. Little variability was seen in the data during treatment.

Aide 3: An increase in the percentage of time spent in instruction was seen for Aide 3. A continuous increase in trend was observed during the course of treatment.

Summary: Figure 1 showed an increase in the percentage of time spent in instruction for three of the four staff members in classroom A.

Classroom B

Teacher: Highly variable baseline and treatment data were seen for the teacher in classroom B. There was little change in the level or trend of the data between the baseline and treatment phases.

Aide 1: The baseline data for Aide 1 were also quite variable but there appeared to be a slight increase in trend during the treatment phase.

Aide 2: The data for Aide 2 showed an increase in the level and trend after the introduction of the independent variable.

Aide 3: The data for Aide 3 were highly variable during both the baseline and treatment phases. An

initial increase in the level of the data was seen after the teacher's attendance at the inservice, but a decrease in the level occurred during the last three weeks of data collection.

Summary: Highly variable data were seen in Classroom B for all of the staff members observed. There appeared to be a significant increase in the percentage of time which Aide 2 spent in instruction during the course of the treatment.

Classroom C

An abrupt change of level was evident in the percentage of time spent in instruction by all of the staff members in Classroom C, after the teacher's attendance at the inservice training program. Little variability was observed in the data.

Classroom D

Teacher: Highly variable baseline data were followed by a more stable treatment phase. A slight increase in trend appeared to occur during treatment.

Aide 1: The baseline data for Aide 1 was also variable. An increase in the level of the data path occurred during the last three weeks of the treatment phase.

Aide 2: A downward trend was seen in the baseline data for Aide 2. An inital increase in level

occurred immediately after treatment but drops by the second week. This was followed by a gradual increase in the data path over the course of treatment.

Aide 3: A high degree of variability was seen during both the baseline and treatment phases. Little change in the level of the data was noted.

Summary: Three of the four staff members in classroom four showed at least a slight increase in the percentage of time spent in instruction.

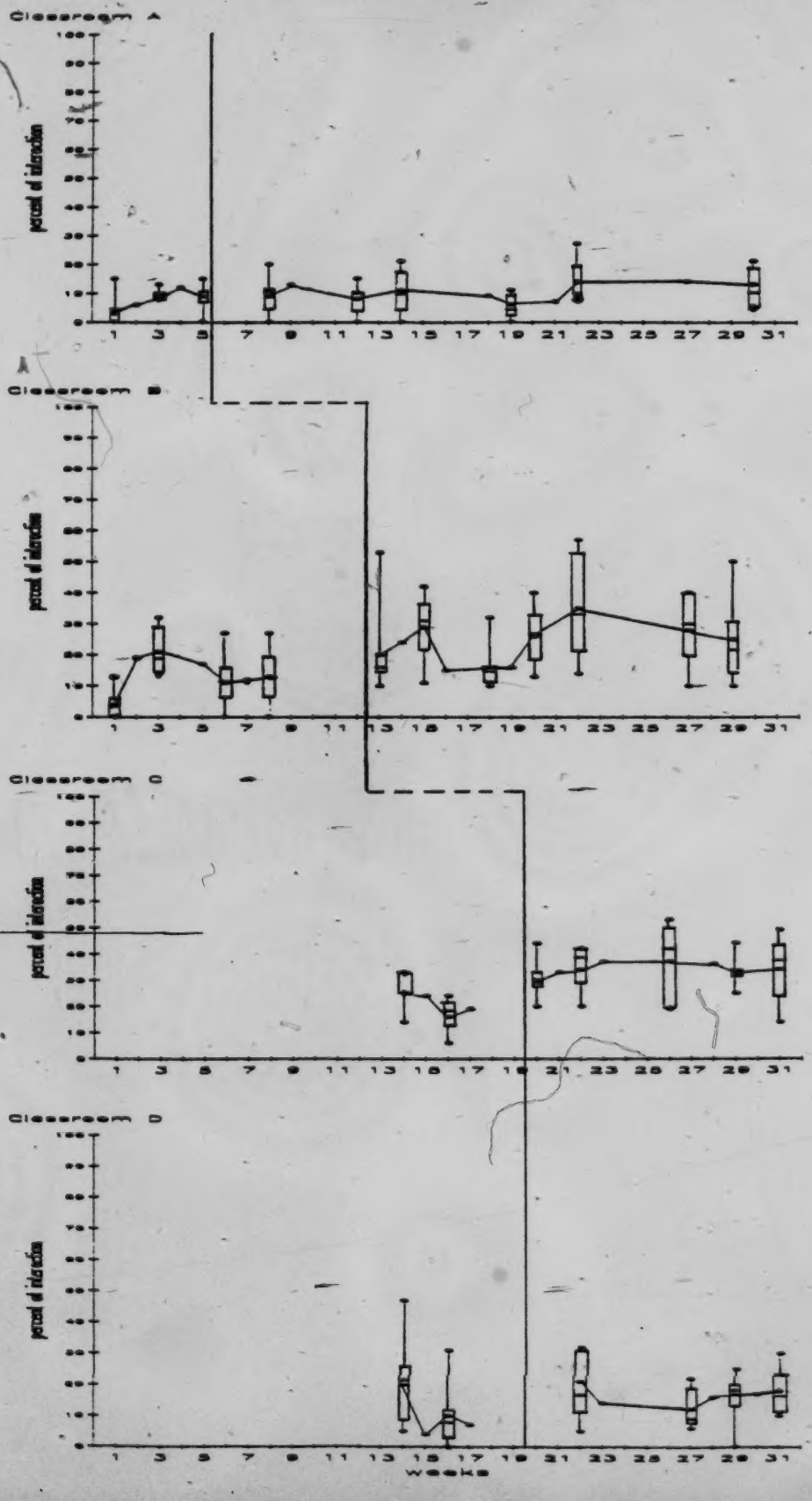
Research Question # 2

> As a result of training, was there a significant increase in the percentage of positive interactions which student's received from classroom staff?

This question was examined through a visual analysis of the data collected on the percentage of positive interaction between staff and students in each of the classrooms. Positive interaction was defined as any contact, verbal or physical, delivered by staff, which is intended to encourage the student to repeat a behavior. For example, "good work:, a pat on the back (see Chapter Four).

Figure 2 shows the percentage of positive interaction across thirty-one weeks of data collection. Baseline was initially started in Classrooms 1 and 2 and then begun in Classrooms 3 and 4. The mean

Figure 2
Percent of Positive Interaction



percentage of positive interaction for all of the students in the classroom for each of the weeks of data collection is indicated by the data points which are joined by the line. The box and whisker graphs indicate the median, the 25th and 75th percentiles, and the range of the scores.

The data indicated little change in positive interaction in any of the classrooms. Classrooms A and D appeared the same during the baseline and treatment conditions.

Classroom B showed variability in the data, both during baseline and treatment phases, with a slight increase in the level of the behavior during the treatment phase. In addition, the upper range of scores were higher during the treatment condition.

The data for Classroom C also indicated a slight increase in level between the baseline and treatment phases. The treatment phase was much more stable than that seen in Classroom B. As in Classroom B, the range of scores was much higher during the treatment condition.

Research Question #3

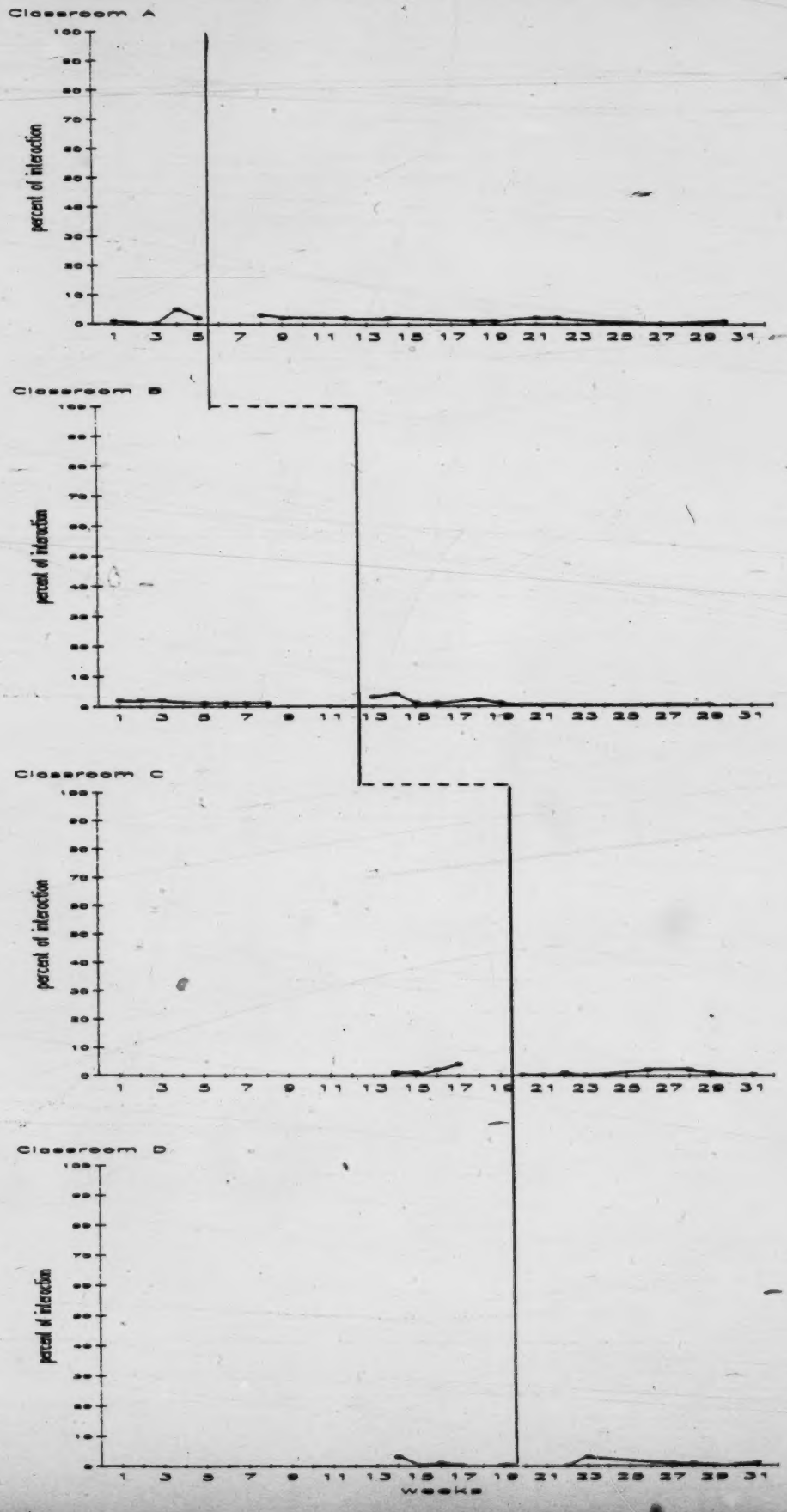
> As a result of training, was there a significant decrease in the percentage of negative interaction which students' received from classroom staff?

In order to assess the impact of the teacher's attendance at the STEP inservice training, data were collected on the negative interaction between staff and students prior to and after the training . Negative interaction was defined as any contact, verbal or physical, delivered by staff, which is intended to discourage the student from repeating a behavior. For example, "no" (see Chapter Four).

Figure 3 displays the data collected on the independent variable over a period of 31 weeks through a partial interval time sampling procedure described in Chapter Five. The data were calculated for each of the students in the classroom for each of the days of data collection. To determine the mean percent of negative interaction for all of the students in the classroom, the average of all of the individual scores was calculated. This is indicated by the data points which are joined by the line on each of the graphs.

There was little negative interaction seen in any of the classrooms before or after treatment.

Figure 3
Percent of Negative Interaction



Research Question #4

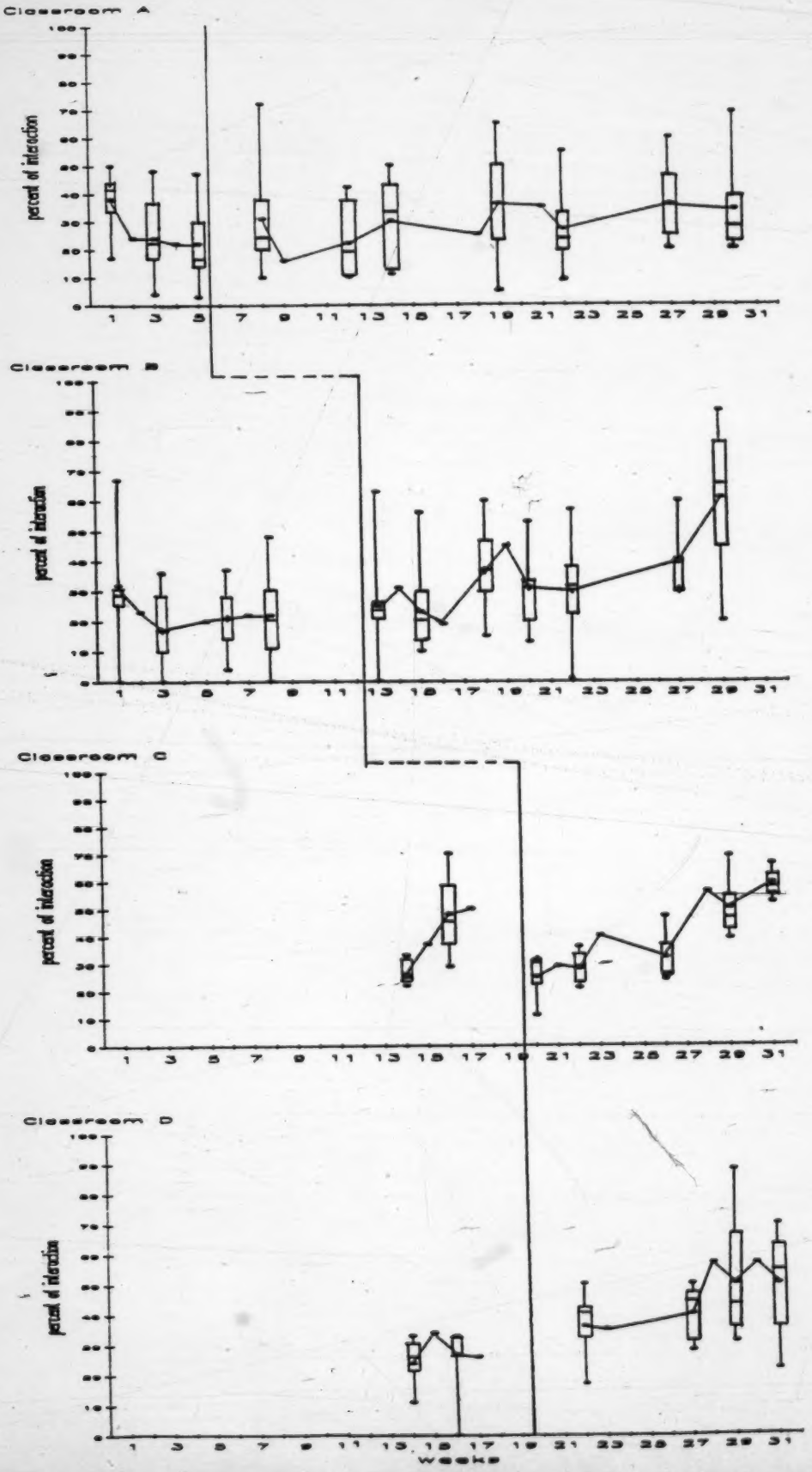
As a result of training, was there a significant change in the percentage of the neutral interaction which students' received from classroom staff?

Data were collected on the amount of neutral interaction delivered by staff to students in each of the four classrooms. Neutral interaction was defined as any contact, verbal, physical, or gestural, delivered by staff, which is intended to neither discourage nor encourage the student to repeat a behavior. For example, conversation. This category also includes assisting students through activities e.g. putting on the student's coat (See Chapter Four).

As with research questions 2 and 3, the data were collected across 31 weeks for each of the students in the classroom using partial interval time sampling procedures. The mean percentage of neutral interaction for all of the students in the classroom is indicated by the data point joined by the line. The box and whisker diagrams are again used to indicate the median, range, and 25th and 75th percentile of the scores.

Figure 4 shows the data for each of the classrooms involved in the study. Classroom A showed a slight upward trend in the data during the treatment phase as well as an increase in the upper range of the scores.

Figure 4
Percent of Neutral Interaction



During baseline the percentage of neutral interaction did not occur more than 50% of the time for any of the students in the classroom, whereas during the treatment phase the range of scores was frequently above the 50% mark. The level of the data in Classroom A does not appear to significantly increase during treatment.

Classroom B shows a gradual upward trend in the data during the treatment phase. This gradual increase may indicate that the teacher required time to implement the procedures suggested during the training program. The level of the data also began to increase towards the end of the treatment phase. The baseline data collected for Classroom B appears to be relatively stable after the first week. The treatment data however, appeared to be fairly variable at least initially.

Classroom C showed an increasing trend during baseline and a significant drop in the level of the data after treatment was introduced. During the treatment phase there was a gradual increase in the trend of the data, but it is possible that a similar or greater increase would have occured without the introduction of treatment. It is interesting to note that the range of scores in classroom C was quite limited. This consistent increase suggested that most

of the students in the classroom were receiving similar amounts of neutral interaction.

The data collected in Classroom D, showed a stable baseline with a slight increase in the level of the data during treatment. The data path indicated an upward trend and a slight increase in the variability of the data. In addition, the range of the scores increased during treatment, indicating that some of the students in the classroom were experiencing a much higher percentage of neutral interaction than occurred during baseline.

Research Question #5

> As a result of training, was there a significant decrease in the percent of time which students' were not receiving interaction from the classroom staff?

In order to determine the percentage of no interaction between staff and students the percentage of intervals where students did not receive any positive, negative, or neutral interaction from staff were calculated.

The data were again collected across the 31 weeks for each of the students in the classroom using partial interval time sampling procedures. The mean percentage of no adult interaction for all of the students in the classroom was indicated by the data points joined by

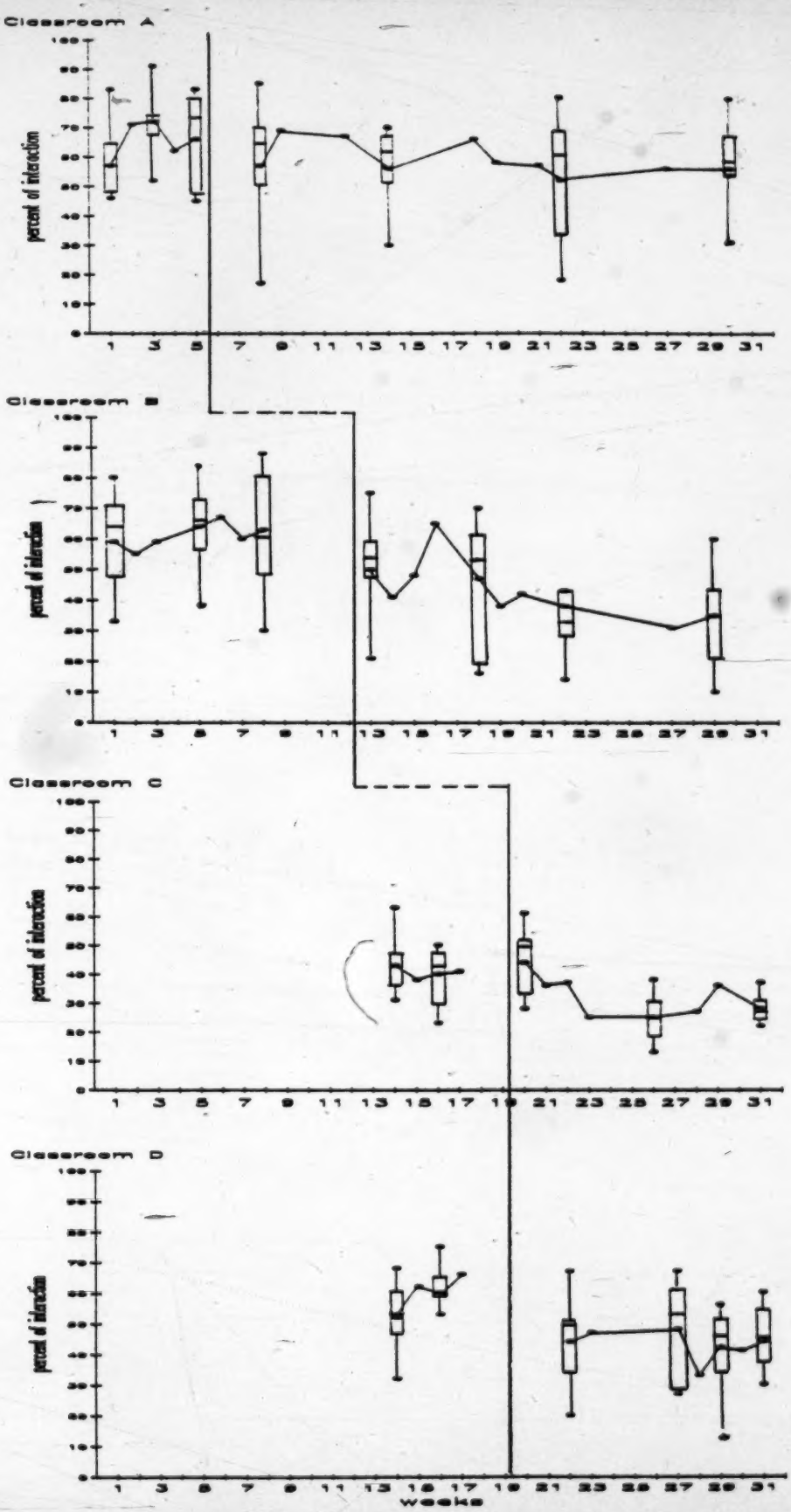
the line. The box and whisker diagrams were again used to indicate the median, range, and 25th and 75th percentile of the scores.

Figure 5 shows the percentage of no interaction occurring across all of the four classrooms in the study. The data paths during baseline and treatment for Classroom A indicated very little change in either the trend of level of the data. An increase in the lower range of scores was evidenced however, by the box and whisker diagrams. This increase indicated that some of the students in the classroom were experiencing a lower percentage of no adult interaction than occurred during baseline. However, it should also be noted that the upper range of scores were still similar to that seen during baseline. Some of the students in the classroom were still experiencing a high percentage of no adult interaction.

The data for Classroom B showed a fairly stable baseline with a decrease in the level and trend of the data path during treatment. Initial variability in the data was seen directly after treatment, with a gradual increase in the stability of the data occuring towards the end of the treatment phase.

The data collected for Classroom C also shows a fairly stable baseline, with a slight decrease in the level of the data path occurring after the introduction

Figure 5
Percent of No Adult Interaction



of treatment. Little variability in the data was observed in either the baseline or treatment phases. The short boxes and narrow range of the whiskers in the box and whisker diagrams, indicated that the students were all receiving a similar percentage of no adult interaction.

The baseline data in Classroom D showed an increasing trend with an abrupt decrease in the level of the data path occuring after treatment. The data collected during the treatment phase showed little downward trend, however, there was a decrease in the lower range of the scores, evidenced by the box and whisker diagrams.

Research Question #6

> As a result of training, was there a significant increase in the percentage of the students' interaction with objects and activities?

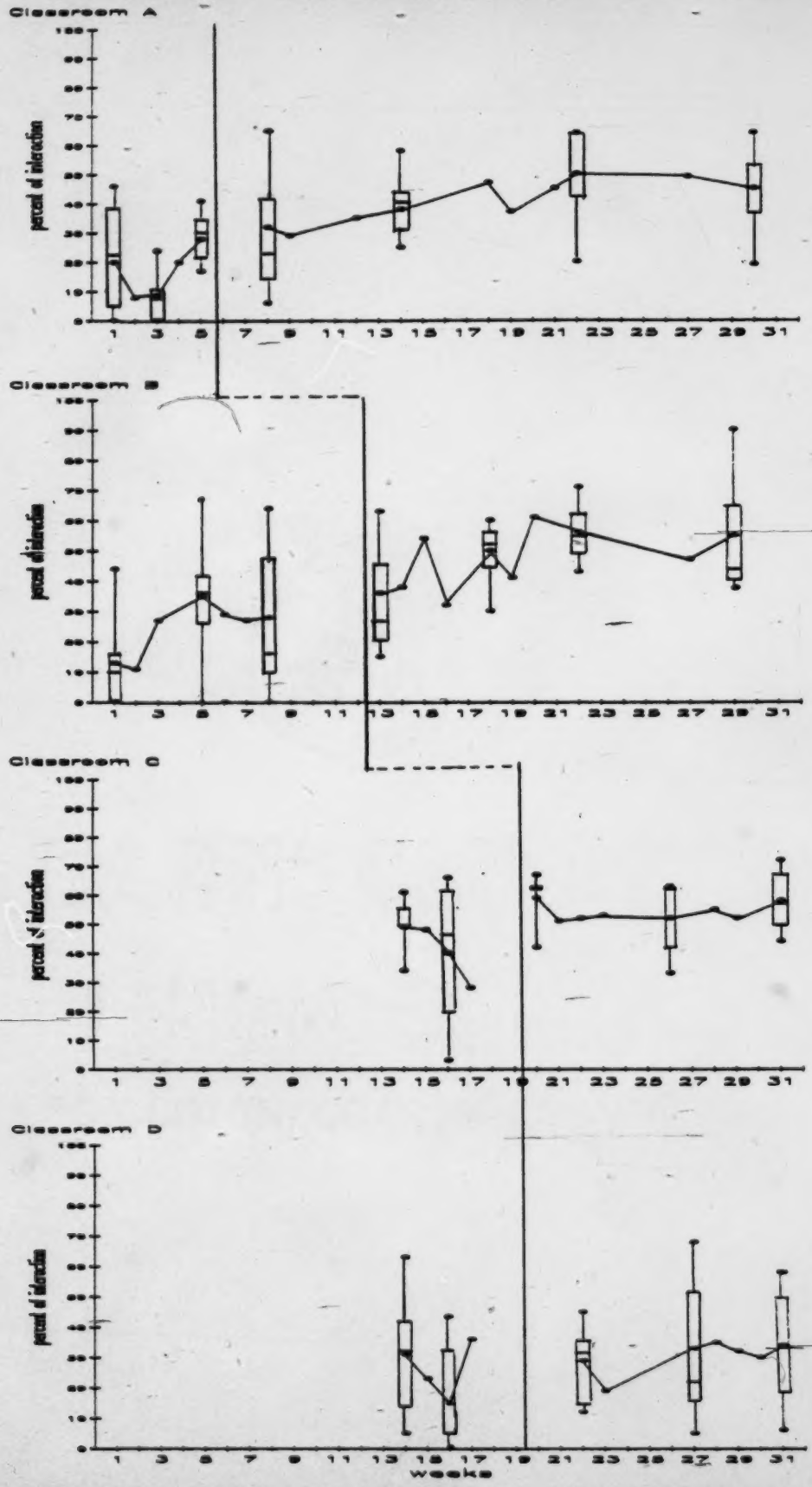
Data were collected on the percentage of appropriate object and activity interactions in which students engaged. Appropriate object interaction was recorded as occuring if the student was interacting with an object or activity in the manner in which it was designed to be manipulated or interacted with (See Chapter Four).

As with the previous research questions the data were collected across a 31 week period. Data were collected for each of the students in the classroom using partial interval time sampling procedures. In Figure 6 the mean percentage of appropriate object interaction for all of the students in the classroom is indicated on the graphs by the data point joined by the line. The box and whisker diagrams were again used to indicate the median, range, and 25th and 75th percentiles of the scores.

Figure 6 shows the percentage of appropriate object interaction across the four classrooms. The data collected for Classroom A showed an upward trend in the data path during the last two days of the baseline. Therefore, even though an upward trend was seen during the treatment phase, it was difficult to determine if this was an extension of the trend observed during the baseline, or if its' occurrence was caused by the introduction of the independent variable. Little variablity in the data was seen during the treatment phase.

The baseline data for Classroom B, showed an initial increase in trend with a leveling off occuring during the last four days of the baseline. Variability in the data is seen during the treatment phase, although a slight increase in trend is observed. Even

Figure 6
Percent of Appropriate Object Interaction



though some decrease in the percentage of appropriate object interaction was seen during the last part of the treatment phase, the level of the data remained above that seen during baseline.

The data collected for Classroom C showed a declining trend in the percentage of appropriate object interaction during the baseline phase. An immediate increase in the level of the data was observed directly after the independent variable was introduced. Little variablity in the data path was seen during the treatment phase.

Classroom D showed little change in either the trend or level of the data during the treatment phase.

Research Question # 7

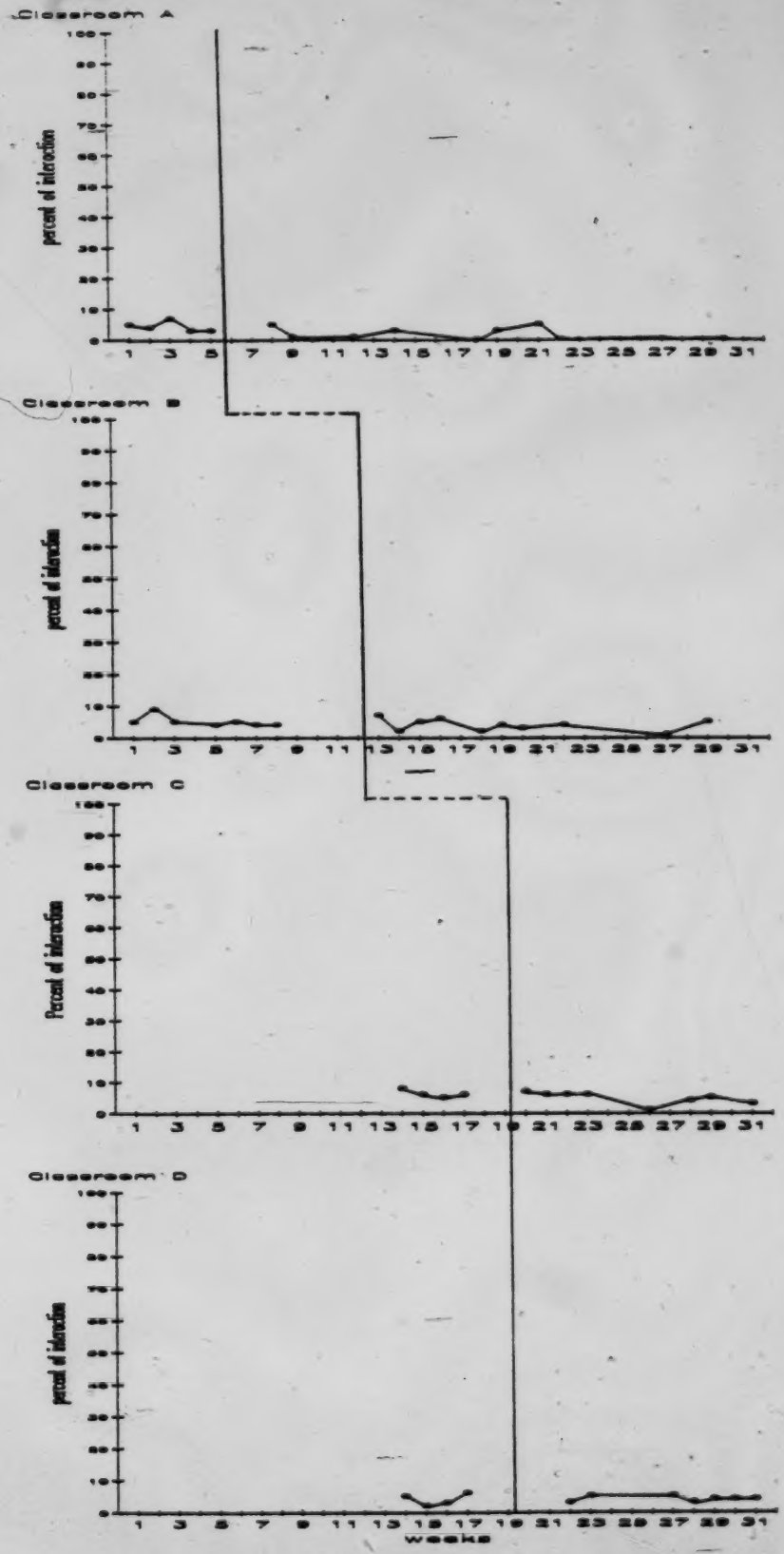
> As a result of training, was there a significant decrease in the percentage of the students' inappropriate interaction with objects and activities?

This question was examined through a visual analysis of the data collected on the percentage of the students' inappropriate interactions with objects. This type of interaction was recorded as occurring if the student was interacting with an object or activity in a manner in which it was not intended to be used.

The data for this dependent variable were collected in a similar manner to that of the previous five questions. Data were collected for each of the students in the classroom over a 31 week period. The data were then graphed to show the percentage of inappropriate object interaction (see Figure 7). The mean percentage of inappropriate object interaction for all of the students in the classroom was indicated on the graphs by the data point joined by the line. The box and whisker diagrams were used to indicate the median, range, and 25th and 75th percentile of the scores.

Figure 7 showed that the percentage of inappropriate object interaction seldom occurred in any of the classrooms during either the baseline or treatment phases.

Figure 7
Percent of Inappropriate Object Interaction



Research Question # 8

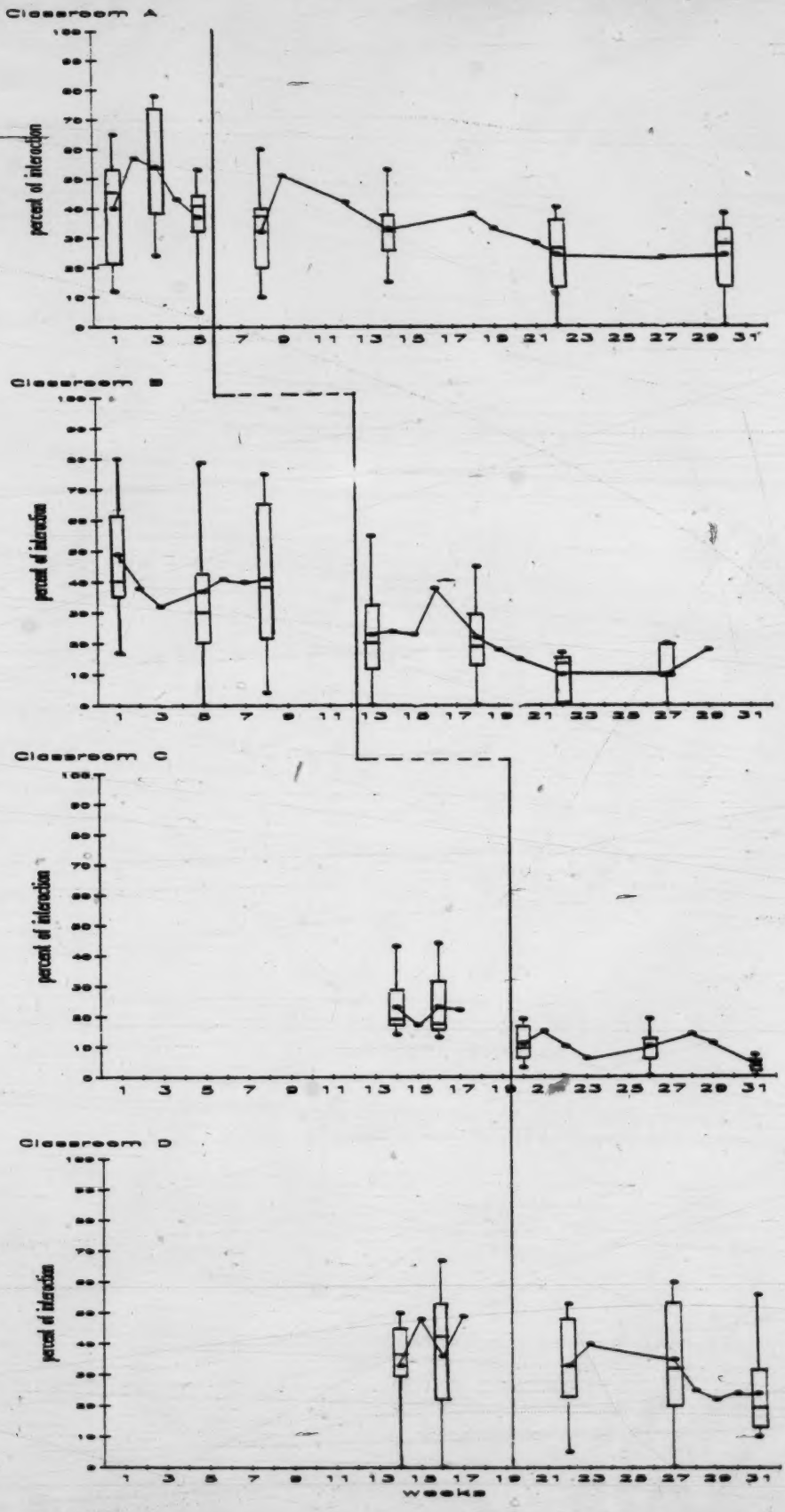
> As a result of training, was there a significant decrease in the percentage of time which students' were not interacting with the teaching staff, other students, objects, or activites (down time)?

The dependent variable in this research question was recorded as occuring if there was no contact between the student and any staff member, other students, objects or activities. The student was either doing nothing or was engaging in self-stimulatory behavior (see Chapter Four).

As with the previous 6 questions data were collected for each of the students in the classroom over a 31 week period using a partial interval time sampling procedure. The data were then graphed to show the percentage of time which students received no interaction from staff, nor interacted with other students, objects or activities (see Figure 8). The mean percentage of no interaction for all of the students in the classroom was indicated on the graphs by the data point joined by the line. The box and whisker diagrams were again used to indicate the median, range, and 25th and 75th percentile of the scores.

Figure 8 shows the percentage of no interaction for the students across all four classrooms. Classroom

Figure 6
Percent of No Interaction



A showed an initial increase in the dependent variable during baseline with a subsequent downward trend occurring during the last few days of baseline. The treatment data also exhibit a downward trend, with less variability and a leveling off of the trend occurring during the last three observation days of the treatment phase.

Classroom B showed a relatively stable baseline, particularly during the last four weeks of data collection. The treatment phase appeared to be initially stable, followed by an increase and then a gradual declining trend in the data. The smaller boxes and shorter whiskers seen in the last two box and whisker diagrams indicated that the majority of students were receiving similar percentages of no interaction. This consistency in the students scores was contrasted with the greater variation seen during the baseline phase.

The data for Classroom C indicated a stable baseline followed by an immediate reduction in the level of the data path, when the independent variable was introduced. There was some variability evidenced during the treatment phase, but all of the percentages were lower than those seen during baseline. As was seen in Classroom B, the students scores were more

consistent during the treatment phase as evidenced by the smaller boxes and shorter whiskers.

A slight change between the baseline and treatment data was noted for Classroom D, although the baseline data were fairly variable, and appeared to show a slight increase in the trend of the data path. The treatment phase appeared to be initially fairly stable with little change seen in the level of the data path. In the last four weeks however, the mean percentage of no interaction dropped slightly and remained fairly stable at the lower level. This decrease in level, is contrasted with the continuance of high scores for some of the students in the classroom.

A discussion of the results of the present study follows in Chapter Seven.

CHAPTER VII

Discussion

The following discussion will attempt to evaluate the specific effects of the S.T.E.P. Inservice Training Model. The results which occurred for each of the dependent variables will be examined and possible reasons for the results will be presented. Due to the lack of homogeneity of the participants and settings involved in the study, the explanatory hypotheses discussed can only be considered to be tentative. Some of the potentially relevent variables will be considered and possible modifications to the inservice will be presented.

Instruction

In general, the teacher's attendance at the S.T.E.P. Inservice, resulted in an increase in the percentage of time which classroom staff spent in instruction. The importance of increasing instructional time for students is stressed by Fisher, Filby, and Marliave (1977), as they contend that more instruction yields more learning. Teaching classroom

teachers to increase the amount of time students spend in instruction was found by Fredericks et al. (1979), to improve the educational gains of students who had severe and profound handicapping conditions.

Since much of the literature supports the importance of increasing instructional time, this was stressed during the inservice. Classroom organization (Fredericks et al., 1979) and inclusion of instruction into caretaking routines (McCormick and Goldman, 1979), were two methods which were presented to teachers as a scheme for increasing the amount of instruction occurring in the classroom.

Although not all of the staff in each of the classrooms showed a significant increase in the percentage of time spent in instruction, a slight overall increase was seen in all the classrooms in the study after training (See Figure 1). The staff working in Classroom C showed the most increase overall. This may have been due to the low student/staff ratio and lack of physically handicapped students in this particular classroom. Once the techniques were taught to the teacher, it was quite easy for her to implement them as the necessary manpower was immediately available. Classrooms which had high student/staff ratios appeared to have more difficulty implementing the suggestions. Snart and Hillyard (1985) found that

decreases in the student/staff ratio increased the amount of instructional time in classrooms.

Classrooms A and B showed a slight increase in the percentage of time some staff spent in instruction. One of the major factors which prevented a more significant increase in the percentage of instructional time in these classrooms appeared to be the number of physically handicapped students who required assistance with all of the basic self-care activities. Due to the students' physical and cognitive limitations, the inclusion of instructional activities during care-taking routines was more difficult than for those students who could realistically be taught to independently feed, toilet, and dress themselves. McCormick and his colleagues (1979) suggested that for some students who have severe motoric involvement, self-care instruction may not be a realistic programming target. It is suggested however, that other instructional targets be used in conjunction with the caretaking activities (McCormick et al., 1979). The integration of additional instructional goals into caretaking activities in order to increase the percentage of time which severely physically handicapped students spend in instruction, is an area which requires more investigation.

The percentage of time which the staff in Classroom D spent in instruction increased slightly for some of the staff in the classroom. The teacher in this classroom had been assigned to the teaching position six weeks prior to her attendance at the Inservice. It appeared to be difficult for the teacher to assimilate the information taught during the inservice, in addition to becoming familiar with the students in the classroom. The physical design of the classroom also prevented the inclusion of instruction into caretaking activities, as there was a shortage of space and facilities in which to toilet and dress the students.

In addition, a longer baseline phase in classrooms C and D would have allowed for a more thorough and detailed analysis of the data before and after the teacher's attendance at the inservice.

An analysis of the data over time indicated that where an increase in the percentage of time spent in instruction was observed, these changes were generally maintained or slightly increased over the treatment phase. This finding would appear to be of particular importance since the effects of inservice training should be maintained across time (Powers, 1983), resulting in durable changes in the behavior patterns seen in the classroom (Smith & Siantz, 1978).

It is also important to note that the teacher's attendance at the Inservice, appeared to effect changes in the other members of the classroom staff who did not attend the Inservice. This transfer of knowledge from one individual to another is crucial in classrooms staffed by paraprofessionals (Paul, 1983).

Summary,

Increases in the percentage of time which classroom staff spent in instruction increased after the onset of treatment across all four of the classrooms. Therefore it is suggested that the teacher's attendance at the S.T.E.P. inservice increased the percentage of time which staff spent in instruction.

The slight degree of change observed in Classrooms A, B, and D, would indicate that more attention should be paid to the specific problems of integrating instruction into care-taking activities, and the problems involved in organizing for instruction when there is a high student/staff ratio. Also, more detailed follow-up visits would allow for more guidance for teachers in adapting the information provided during the inservice for use with their particular students.

Staff/Student Interaction

The acknowledgment of correct responses through praise and reinforcing comments was correlated with more effective teaching in a study by Englert (1984). Fredericks et al. (1979) also cited the importance of using positive reinforcement after correct responses in classrooms for the severely and profoundly handicapped. As pointed out by Snell and Smith (1978),

> Positive reinforcement, central to behavior modification, is by far the most essential and powerful strategy a teacher may employ. (p. 75).

However, after the teachers' attendance at the S.T.E.P. Inservice, there was no increase in the percentage of positive interaction found in Classrooms A and D. A slight increase in the range of scores in Classroom B was observed, and a more significant increase in both the level and trend of the data was seen in Classroom C (See Figure 2).

Since increases in positive interaction were only observed in two of the classrooms, it is not possible to conclude that the independent variable was responsible for the changes as other variables could have influenced the results.

The lack of significant change may be due to the difficulties which staff encountered in implementing the instructional techniques presented during the

inservice. Consistency in the delivery of cues and consequences in the four classrooms was observed to be lacking during follow-up visits to the classrooms. Therefore, it may have been more effective to spend additional time during the Inservice in practicing the techniques presented. Although each teacher was expected to reach criteria during the Inservice week on the delivery of positive reinforcement, additional practicum time spent on this facet of the inservice training may have been beneficial. The practical application of techniques during the inservice can lead to the maintenance of these techniques (Kelly & Vanvactor, 1983).

In addition, specific strategies for the presentation of the instructional techniques to the support staff in the classrooms could have been more detailed. This would have enabled teachers to more easily transfer knowledge to their staff. Additional practice sessions during the follow-up may have also improved the percentage of postitive interaction between staff and students.

Another aspect of the presentation of the Inservice which should be considered is the amount of information presented to teachers during the one week period. The variety of material presented to teachers in the short time frame made it difficult for teachers

to assimilate all of the information at once. If the Inservice was divided into modules and presented to teachers once every two weeks for twelve sessions, with practice and feedback time scheduled between modules, the lasting effects of the Inservice may be more apparent.

The negative interaction data collected across the four classrooms indicated that there was little negative interaction either before or after treatment in any of the four classsrooms (See Figure 3). The lack of negative interaction prior to treatment would suggest that the inclusion of the module on the reduction of negative interaction in the Inservice was not necessary for this particular group of teachers. It is suggested that in the future the content of the inservice be planned in response to the assessed needs of the teachers, so that the content is more applicable to the participants' individual needs (Korinek et al., 1985).

In general, the training of teachers during the S.T.E.P. Inservice resulted in an increase in the percentage of neutral interaction in three of the four classrooms (See Figure 4). A slight increase in the range of scores were observed in Classroom A, but little change in the trend or level of the data were noted.

Some change in the percentage of neutral interaction was observed in three of the four classrooms involved in the study. This increase gives support to the conclusion that the teacher's attendance at the S.T.E.P. training resulted in an increase in neutral interaction.

An analysis of the data across time indicated a gradual increase in the data after treatment. This continual increase supports the use of follow-up procedures to strengthen and maintain the gains made during the Inservice (Mann, 1976). A closer analysis of the data reveals that the classroom which showed little change on this variable is also one of the classrooms which showed no change on the positive interaction variable. This was the classroom which had a high percentage of physically handicapped students and a high student/staff ratio. The staff had difficulty finding time to care for the physical needs of the students and therefore did not interact with the students as often as occurred in other classrooms.

Since students who are characterized as severely handicapped are often not able to imitate others nor move independently (Sontag et al., 1973), it is therefore necessary that they receive adult interaction in order to complete even simple tasks. Therefore, a decrease in the percentage of time which students are

not receiving adult interaction would lead one to assume that they are receiving more assistance and educational input.

The percentage of time which the classroom staff did not interact with students decreased in all four classrooms across the course of the study (See figure 5). However, the decreases seen in Classrooms A and C were very slight. This variability in the data across classrooms again reinforces the need for consistent and intensive follow-up sessions. In addition, the presentation of the inservice over a longer period of time would allow teachers to practice one aspect of the training, before being inundated with more information.

A decrease in the percentage of no adult interaction was seen in three of the four classrooms involved in the study. Since the decrease occurred after the teacher's attendance at the inservice in each of the classrooms it is suggested that the independent variable was responsible for the changes observed.

Summary.

The analysis of the treatment effects associated with staff-student interaction shows a variation in the data across classrooms and across the types of interaction observed. Although the heterogeneity of the participants and settings involved in the study makes it difficult to form any definite conclusions as

to the reasons for these differences, some possible theories have been presented.

Student/Object Interaction

In general, visual analysis of the observational data revealed that students in three of the classrooms in the study increased in the percentage of time spent interacting with objects and activities as a result of treatment (See Figure 6). Since the changes occurred after the independent variable was introduced in three of the four classrooms, the multiple baseline design supports the premise that the independent variable was responsible for the changes observed.

Since students with severe and profound handicapping conditions have difficulty learning by watching, it is important that they have direct interaction with objects and activities. Rosenshine (1980) correlated achievement with a high level of object/activity interaction.

Staff members working in the classrooms reported that with the increase in student involvement in activities, students appeared to be more alert and less likely to engage in self-stimulatory or off-task behavior. In addition, staff were in favour of the

programming changes which teachers made in their classrooms after their attendance at the Inservice.

The lack of treatment effect demonstrated in the fourth classroom may again be due to the number of physically handicapped students, the high student/staff ratio, and the difficulties which the new teacher encountered in adjusting to the classroom. Also, it was difficult for teachers to find activities which physically handicapped students could engage in independently or with minimal physical assistance. Modification of the inservice to include strategies for organizing classrooms with high numbers of physically handicapped students, could help to increase the percentage of time which students interacted with objects and activities.

The data collected on the percentage of inappropriate object interaction shows that there was little inappropriate interaction with objects or activities demonstrated by any of the students in the four classrooms, either before or after treatment (See Figure 7). This was an area of the Inservice which was not necessary for this particular group of teachers to learn. It would have been appropriate to survey the teachers prior to the inservice in order to have input into the topics covered (Healy, 1983). This could lead to higher teacher satisfaction with the content of the

inservice and time could be spent on more applicable material.

Summary.

In three of the four classrooms involved in the study, the percentage of interaction with objects and activities appeared to increase as a result of the training. The data collected in the fourth classroom did not show any change as a result of the training. Modifications to the inservice module may assist teachers in providing appropriate activities for students involved in their classrooms.

No Interaction

A visual analysis of the observational data showed that decreases in the percentage of time which students spent not interacting with staff, other students, objects or activities was observed across all four classrooms after the teacher's attendance at the S.T.E.P. inservice. Since the changes occurred after the introduction of the independent variable and a multiple baseline design was used in the study it is possible to conclude that the independent variable was responsible for the changes observed.

The reduction of time which students spend doing nothing "down time", and the replacement of that time

with learning activities, was found to lead to higher gains in student performance in a study by Wiley and Harnischfeger (1974). The present study supports the premise that the teacher's attendance at the Inservice can decrease the percentage of "down time" in classrooms, but does not address subsequent improvements in student achievement as a result of this decrease in "down time". This would appear to be a logical question to address during future research.

Conclusion

Classrooms for severely and profoundly handicapped students have become a reality in most school jurisdictions during the last decade. However, many teachers do not possess the skills necessary to teach this population (Brooks, 1983). One method of improving teacher skills and providing new information to teachers is through inservice training (Thomas, 1980).

This study has evaluated the effect of the S.T.E.P. Inservice Training which was designed to improve teacher's skills in teaching students with severe and profound handicapping conditions. The specific areas addressed include increases in percentage of time which students spent in instruction,

increases in the percentage of staff/student interactions, increases in student/object interaction, and decreases in the percentage of "down time" for students.

An analysis of the data collected over the thirty-one week observational period suggested that the teachers' attendance at the S.T.E.P. Inservice did result in significant changes in instructional time, staff/student interaction, and student/object interaction. It was noted, however, that some of the participants showed minimal gains on the variables under investigation.

Due to the heterogeneity of the participants and settings involved in the study, conclusive reasons for the variabilty of the treatment effects were not possible. However, tentative hypotheses concerning relevent variables have been generated and modifications to the inservice to enhance teacher performance were discussed. The use of a multiple baseline design in the study allowed for the comparison of data across the four classrooms and supported the hypotheses which were generated. Further research into the content and presentation of inservices to enhance teacher performance when teaching severely and profoundly handicapped students is needed.

Future Directions

Several changes to the S.T.E.P. inservice are suggested as a result of the study. These include:

1. Presenting the inservice modules over time, rather than compressing the entire inservice into one week. This would allow teachers to practice skills pertaining to each module after each lecture and then spend time implementing the suggestions for that specific module in their classrooms.
2. Provide more intensive follow-up with teachers in their classrooms so that problems with implementation can be addressed.
3. Including more information on how to integrate instruction into care-taking activities.
4. Provide more practice on the instructional design portion of the inservice, particularly in the area of positive interaction.
5. Including a section on how teachers can teach classroom staff the techniques taught during the inservice. An aide training package may also be an appropriate addition to the inservice.

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APPENDIX A

OBJECTIVES OF INSERVICE PACKAGE

OBJECTIVES OF INSERVICE PACKAGE

OBJECTIVES	ACTIVITY/EVALUATION
Assessment/Curriculum	
1) There will be an increase in the proportion of functionally written programs.	1a) During training the trainee will write a functional skill sequence with 90% accuracy. 1b) During the follow up assessment visit, at least 70% of the written programs for each student will be functional.
2) The percentage of functional activities which the teacher plans will increase.	2) During the followup assessment visit, at least 80% of the time students will be engaging in functional age-appropriate activities using functional materials.
3) The trainee will demonstrate the ability to task-analyze programs.	3) During the followup assessment visit, at least 80% of programs have been task analyzed by the trainee for a particular student.

4) As a result of training the trainee will demonstrate the ability to use ecological assessment and standardized assessment instruments to effectively develop the students IEP's.	4a) During training the trainee will demonstrate the ability to administer part of a standardized assessment instrument to a peer, using correct cues, consequences and reinforcement procedures. 4b) During the follow up assessment visit all of the students sampled (1/4 of the classroom population) will have been assessed in at least two areas/domains. 4c) During the follow up assessment visit all of the students sampled (25% of the classroom population) will have at least 80% of their programming based on initial assessment information.
5) As a result of training, the percentage of programs occurring in context will increase.	5) During the followup assessment visit, at least 3 programs for each student sampled (25% of the classroom population) will occur in the natural context and at appropriate times.
6) As a result of training, the trainee will be able to priorize goals and objectives for students.	6) During training, the trainee will receive 100% on the assessment study question.

Instructional Design

7) As a result of training, the the trainee will demonstrate correct delivery of cues and consequences in 1:1 teaching situations.	7) During training and follow up visit the trainee will score 90% appropriate delivery of cues, consequences, and accuracy in recording data on the Individual Observation form.
8) As a result of training, the trainee will demonstrate correct delivery of cues and consequences in group teaching situations.	8) During training and the follow up visit the trainee will score 90% on the appropriate delivery of cues and consequences on the Group Observation Form.
9) As a result of training, the trainee will demonstrate the ability to train the classroom staff in the use of appropriate cues and consequences in 1:1 teaching situations.	9) During the followup assessment visit, the classroom staff will score 90% on the Individual Observation Form in the areas of cue and consequence delivery and data collection.
10) As a result of training, the trainee will demonstrate the ability to train the classroom staff in the use of appropriate cues and consequences in group teaching situations.	10) During the follow up assessment visit, classroom staff will score 90% on the Group Observation Form in the areas of cue and consequence delivery.
11) As a result of training, the positive interaction between staff and students will increase. At least a 4:1 positive to negative ratio will be demonstrated by the teacher and classroom assistants.	11) During the training and the follow up visit, the classroom staff will deliver at least 4 positive consequences for every 1 correction procedure delivered,

	as measured by the group observation form.
12) As a result of training interaction/instruction will increase and will occur at least once every two minutes for each student.	12) During the training and follow up visit, the trainee and classroom staff will interact with each student in the class at least once every two minutes as measured by the Group Observation form.
13) As a result of training, the the percentage of time which staff encourage students to interact appropriately with objects will increase.	13) During training and follow-up visit, the trainee and classroom staff will encourage each student to be actively involved in an activity at least once every 2 minutes.
14) As a result of training, the trainee will demonstrate knowledge of the components of the instructional design module.	14) During training the trainee will score 90% on the instructional design study questions.
1:1 Instruction (written programs)	
15) As a result of training the trainee will demonstrate knowledge of the components in the clipboard module.	15) During training the trainee will score (90%) on the clipboard study questions.
16) As a result of training the trainee will be able to prepare individual clipboard/ binders for each student, including the following components: a) weekly cover sheet	16a) During training the trainee will score (83%) on the clipboard assignment. 16b) During the follow

b) reinforcers to be used
c) skills to be generalized
d) language level of student
e) general comments
f) cues (verbal and non-verbal)
g) correction procedure
h) reinforcement procedure and ratio.
i) materials/setting
j) criterion level for advancement.
k) task analysis
l) raw data sheet
m) baseline on raw data sheet.

up visit 25% of the clipboards/binders surveyed for the appropriate parts-will be correct at 90% criterion.

Supervision of Classroom Staff

17) As a result of training, the trainee will correctly use the Teaching Research staff observation forms to observe the classroom staff in both 1:1 and group teaching situations.

17a) During training, the trainee will complete 2 ten minute observations of individual instruction with 85% agreement between the teacher and the trainer as to the appropriate delivery of cues, consequences, and data collection.

17b) During training the trainee will complete 2 - 10 minute observations of group instruction with 80% agreement between the trainee and the trainer as to the appropriate delivery of cues, consequences, the positive to negative ratio of consequences and the rotation of attention among the students.

18) As a result of training, the trainee will correctly give feedback to the classroom staff.	18) The trainee will be observed twice during the training week giving feedback to the classroom staff on the appropriateness of their instructional methods in group and 1:1 teaching situations. A criterion of 90% appropriate feedback will be obtained on the evaluation form.
19) As a result of training, the trainee will use his/her time appropriately to manage the classroom, in terms of administration, interactions with staff and students and scheduling.	19) The trainee will complete 80% of the items on the Teacher's checklist on the Teaching Research teacher observation form.
Data Analysis	
20) As a result of training, the trainee will be able to update existing prescriptive programs based on data collected during teaching sessions (whole task, trial by trial and probe data).	20a) The trainee will complete the updating exercise with 80% accuracy. 20b) The trainee will complete the data analysis study questions with 90% accuracy. 20c) The trainee will participate in an updating session during the training week.

	20d) During the follow-up assessment, 25% of the student's clipboards will be assessed for correct updating procedures. 80% appropriate updating.
Group Programming	
21) The trainee will manage children in a group instructional activity.	21a) Meet criteria on the Group Observation Form see objective 7.
	21b) The trainee will conduct individualized educational programs while managing a group of students, presenting the instructional item and recording the student's response through the use of probe data.
22) The trainee will program activities appropriate for group instruction.	22a) The trainee will develop a list of activities based on a specific theme. Criteria: 90% of the activities will be functional.
	22b) The trainee will write programs for group instruction.
	22c) The trainee will be familiar with the data sheets appropriate for group instruction.

	22d) During the follow up assessment, 4 group programs observed will have provisions for data collection at least once per week.
Working with Parents and Classroom Staff	
23) The trainee will encourage open communication between school and home.	23a) The trainee will receive 4/4 (100%) on the study question pertaining to parents. 23b) During the follow up assessment it will be found that 100% of the parents/surrogates participate in at least one of the following options: - volunteer in classroom - phone calls, home visits, conferences or notes home on a regular basis - conduct home programs
Behavior Management	
24) The trainee will understand the communicative function of behavior.	24) The trainee will receive a score of at least 85% on the behavior management study question.

Total Task Instruction

25) The trainee will demonstrate practical knowledge of the principals of total task instruction. task instruction.	25a) During training the trainee will score 80% on the questions pertaining to total 25b) During the follow up assessment visit, 3/3 total task programs reviewed will include the necessary components.

APPENDIX B

Staff Characteristics

Staff Characteristics

Program No.	Staff Pos.	Professional Training	Prev. Experience	Yrs. worked
A	Teacher	B.Ed.	TMH Dependent Handicapped	6 1/2 yrs
A	Aide	-	TMH Dependent Handicapped	11 years
A	Aide	Rehab. Practitioner	TMH Dependent Handicapped	3 years
A	Aide	-	Dependent Handicapped	3 years
B	Teacher	B.Ed. Special Education	Dependent Handicapped TMH	7 years
B	Aide	Grade 12	Dependent Handicapped	9 months
B	Aide	-	Dependent Handicapped	5 years
B	Aide	-	Dependent Handicapped	4 years

Program No.	Staff Pos.	Professional Training	Prev. Experience	Yrs. worked
C	Teacher	B.Ed. Special Ed. Early Ed.	Dependent Handicapped Autistic Mentally Handicapped	4 years
C	Aide	Teaching Certificate	Dependent Handicapped	8 years
C	Aide	1 year Special Ed. University	Dependent Handicapped Autistic	6 years
D	Teacher	B.A, B.Ed. M.Ed. Special Education	Worked with Dependent Handicapped students in group home Taught D.H. students	4 years 6 years
D	Aide	Grade 12	Volunteer working with the handicapped	2 years
D	Aide	Grade 12	Worked in a day care Worked with handicapped	3 years 2 years
D	Aide	Grade 12 some courses from University	Worked with Dependent Handicapped Some experience with T.M.H.	3 years

APPENDIX C

Student Characteristics

Student Characteristics

Program No.	Child No.	C.A.	Sex	Handicap/ Ambulation
A	01	8-01	F	developmental delay walker
A	02	7-11	M	developmental delay cerebral palsy visual impairment wheelchair
A	03	16-05	M	developmental delay canes
A	04	18-02	M	developmental delay wheelchair
A	05	15-02	F	developmental delay physically handicapped visual impairment wheelchair
A	06	14-08	M	developmental delay cerebral palsy wheelchair
A	07	6-11	F	developmental delay cerebral palsy convulsive disorder wheelchair
A	08	10-07	M	developmental delay cerebral palsy wheelchair

Program No.	Child No.	C.A.	Sex	Handicap/ Ambulation
A	09	15-03	M	developmental delay convulsive disorder walker
B	10	10-04	M	developmental delay convulsive disorder microcephaly walks
B	11	11-11	M	developmental delay spastic quadriparetic cerebral palsy wheelchair
B	12	13-11	M	developmental delay cerebral palsy wheelchair
B	13	9-08	F	developmental delay autism walks
B	14	12-04	M	developmental delay walks
B	15	10-05	F	developmental delay cortical atrophy mild hearing loss convulsive disorder wheelchair
B	16	12-11	M	developmental delay convulsive disorder walks hesitantly

Program No.	Child No.	C.A.	Sex	Handicap/ Ambulation
B	17	13-08	F	developmental delay cerebral palsy wheelchair
B	18	11-07	F	developmental delay hypotonic leg braces microcephaly crawls, wheelchair
C	19	5-09	F	developmental delay visually impaired behavior disorder walks hesitantly
C	20	6-01	F	developmental delay autism walks
C	21	6-01	M	developmental delay autism walks
C	22	5-02	M	developmental delay autism walks
C	23	4-07	M	developmental delay walks
D	24	17-11	F	developmental delay spastic quadriplegia wheelchair

Program No.	Child No.	C.A.	Sex	Handicap/ Ambulation
D	25	16-00	M	developmental delay walks
D	26	15-06	M	developmental delay cerebral palsy convulsive disorder wheelchair
D	27	16-02	F	developmental delay convulsive disorder microcephaly wheelchair
D	28	18-07	F	developmental delay visual impairment spastic quadriparesis wheelchair
D	29	14-09	F	developmental delay autism walks
D	30	15-10	F	developmental delay spastic diplegia convulsive disorder wheelchair
D	31	17-06	M	developmental delay athetoid spastic quadriplegia wheelchair
D	32	13-08	M	developmental delay walks